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EDITORIAL

THE RETICULO-ENDOTHELIAL SYSTEM¹

To those whose business it is to classify the literature of "scientific medicine," something, by the way, quite different from the literature of "medical science," there is no fact more salient and arresting than the chaotic status of such literature. That every war of consequence since the invention of printing has been followed by an upthrust of literary activity is well-known, but never before in the history of the world has experimental medicine engendered such an astounding proliferation of recorded facts and opinions. The mental symbol is that of Stephen Leacock's young woman who got upon a horse and rode rapidly "in all directions." An example, near at hand, is the immense array of literature upon the active and passive relations of insulin. Billing's young chemist, who attempted to analyze a rat by "putting the entire animal into his crucible," would to-day experiment with the effect of the clear filtrate upon everything and of everything upon the filtrate. The terminology attaching to such literature is equally chaotic, suggesting the need of Occam's razor (*entia non sunt multiplicanda*) and justifying Fletcher's dictum: "The whole world is in a conspiracy against bibliographers." Where experimentation is either haphazard or radiates from a substance or organ "in all directions," it is obvious that a certain percentage of the problems will be "illusory problems" (*Scheinprobleme*) and a certain proportion of the

¹ The data in this editorial are derived from Aschoff's Lectures on Pathology (New York, 1924), from the Summaries of Krumbhaar and others, and from the exhaustive abstract of the literature kindly supplied the writer by Dr. Benjamin Sacks (Trudeau, N. Y.).

findings *Scheinwissenschaft*, i.e., ascertained or ascertainable knowledge which turns out to be of no positive (i.e., of no practical) value. Many of the findings are, at the same time, so disparate and contradictory that they fall easily into the same negative class of "unknown quantities that are not worth knowing." The genius of unimaginable powers who is to weave this great welter of seemingly unrelated facts into a consistent, understandable fabric is yet to appear. The lengthy summaries made are often unintelligible. But where a certain trend of thought or experimentation has at length found itself, and has acquired a sense of direction, there appears, now and then, some honest spirit who, like the vector in mathematics, is a "directive quantity" or agent, bringing some order and relativity into chaos. Such a man is Professor Ludwig Aschoff, whose remarkable synthesis of the reticulo-endothelial system is comparable with what Waldeyer did for the neuron theory in 1891. In his Janeway Lecture (1924), Aschoff very modestly states that the conclusions reached by himself and Landau in 1913 are drawn "from a large number of individual observations of previous investigators, the value and importance of which were forcibly impressed upon us by our own studies." At the same time, he admits that the centric idea, that of a scattered group of stationary cells in the body as coefficients in tissue-repair, immunity, haemolysis and other functions, was initially one of those flashes of insight which were possible to the genius of Metchnikoff. In his brilliant fantasies on the theme "phagocytosis," the great Russian biologist was sometimes led into extravagance, but his whole scheme of experimentation was elevated and sustained by an ardent desire to be of service in the relief of human suffering.

In his lectures on the comparative pathology of inflammation (1892), Metchnikoff stated clearly that the endothelial cells in the walls of blood-vessels have a phagocytic function, apart from the leucocytes. In his lectures on immunity (1901), he extended this function to the large mononuclear leucocytes (monocytes) or "macrophages," to the lymphocytes, to the so-called *elasmato-cytes* (histiocytes) of Ranvier and to similar fixed cells in the spleen, the lymph-nodes, the connective tissue, the neuroglia and muscle fibre. He also demonstrated their power to engulf and digest (haemolyze) red blood cells, their distribution in the he-

patic veins, the vena cava and the heart, and the rôle of this "digestive system within the tissues" in the resolution of inflammation and as defensive mechanisms of the body. To the macrophages, Metchnikoff, in fact, attributed the formation of agglutinins, coagulins and other antibodies or protective ferments. He showed how ganglion cells practise phagocytosis upon the lepra bacillus and the phagocytic rôle of the Kupfer cells in the liver and of the dust cells in the lung. This chapter in Metchnikoff's treatise on immunity² Aschoff regards as "the most significant in the whole conception of *defensio*, by which term is indicated the reactive processes of inflammation." It is clear that Metchnikoff first sensed the extensive distribution and specific functions of both fixed and circulating phagocytic cells.

Ranvier, who first observed the fixed cells in the omentum, thought they were migrated, modified leucocytes. Marchand, in 1901, demonstrated their origin in the connective tissue and their capacity to acquire phagocytic functions. The improved lithium carmine stain of Ribbert (1904) and the intra-vital staining methods employed by Ehrlich and Goldmann served to identify such cells, to map out the locus of the system, and to establish its specific capacity for storage of extraneous particles (*Speicherung*) as distinguished from ordinary phagocytosis, reinforcing Metchnikoff's view of its metabolic (digestive and excretory) function. Kiyono, a pupil of Aschoff, studied the properties of these cells throughout the entire animal series, "from mammals to cyclostomes" and showed how they may enter the venous channels at all points. Aschoff then mapped out the true reticulo-endothelial system as made up of stationary or fixed cells (histioblasts or fixed histiocytes) in the reticulum of the spleen and lymphoid tissue, in the endothelium of the lymph sinus and of the capillaries of the liver, bone-marrow, spleen, adrenal cortex and pituitary gland, with the migrating histiocytes, the large mononuclears (monocytes) and the splenocytes as outriders, and the chromatophores, neuroglia cells, and interstitial cells of the testis and ovary as accessory units. The cells composing the system are not necessarily identical in structure but are similar in function and staining reactions. They apparently play an

² Wrongly stated by Aschoff (p. 3) to be Chapter V, but in reality Chapter IV.

important part in blood production (myeloid and lymphoid elements), a still more important rôle in blood destruction (haemolysis), both of red cells and thrombocytes, in bilirubin production, in the storage and metabolism of iron, fat and proteins, and in the production of protective ferments (antibodies). The unity of the system, as established by countless experiments, is functional rather than morphological.

The importance of the reticulo-endothelial system begins to loom large when we consider its relation to pathological formations. First of all, in local inflammation and its resolution, the histiocytes act as scavengers and remove debris, *e. g.*, in the exudates of pleurisy and peritonitis. At the same time, in contrast with the mesothelial cells, they play a major part in the formation of granulation tissue. One of the earliest observations of monocytosis or histiocytosis was in the case of typhoid fever by Mallory (1898) and others, even to the extent of plugging the smaller pulmonary arteries (MacCallum). The same outpouring of the fixed and floating (mononuclear) cells has been noticed in subacute bacterial endocarditis, malarial fever, small-pox, paroxysmal haemoglobinuria and other conditions. A monocytic or splenocytic leukaemia has been observed by a few writers, but its existence is still in dispute. By intra-vital staining, Goldmann, Kiyono and others were able to prove that the essential element of tubercle is derived from the reticuloendothelial system, which is also true of the lymphatic proliferation in typhoid fever (Mallory), the malarial spleen, the leproma, sporotrichoma, rhinoscleroma, actinomycoma, pseudo-xanthoma and other granulomatous formations, in which the pathogens are phagocytosed, and digested within the engulfing cells. These are true defensive reactions. The clearing up of extraneous particles in the body, *e.g.*, in anthracosis or siderosis, is accomplished in the same way. There is the same defensive engulfing in kala azar and other protozoan affections. The storage and haemolysis of effete red blood cells by histiocytes in the spleen and elsewhere is characteristic of Weil's disease (Lepehne), typhoid fever (Mallory) and subacute bacterial endocarditis (Libman). There is an enormous destruction of erythrocytes in experimental poisoning by arseniuretted hydrogen (birds) and phenylhydrazine (dogs). Blockage of the reticuloendothelial system with collargol injections

(Lepehne) sometimes inhibits, sometimes stimulates its activities, according to receptivity. This may explain some of the vagaries of colloidal therapy.

Much new light has been thrown upon the aetiology of jaundice through experiments indicating that the conversion of haemoglobin into bilirubin is ordinarily accomplished in the Kupffer cells of the liver, but can also be produced on occasion in the spleen and other organs after excision or exclusion of the liver (Mann). In haemolytic jaundice, the spleen is extensively involved, as indicated by the disappearance of the symptoms after splenectomy (Krumbhaar). This contravenes the older theory of Minkowski and Naunyn, that the liver is the sole seat of jaundice or bilirubin production. The rationale of splenectomy in Banti's disease is to be explained in the same way. In pernicious anaemia, on the other hand, splenectomy gives only temporary relief, due to the fact that the locus of blood destruction is distributed over the entire reticulo-endothelial system (Krumbhaar). The success of irradiation of the spleen in purpura haemorrhagica with diminished thrombocytes is significant. In the familial splenic anaemia known as Gaucher's disease, the systemic lesions are endothelial, although as Mandlebaum and Downey have shown (1916), the products of cellular metabolism are not as in diabetic lipaemia of lipoid character. Like the reticular sarcomata and primary endotheliomata described by Ewing, Gaucher's disease may perhaps be regarded as a neoplasm of the reticuloendothelial system. Although some of the findings of experimentation, *e.g.*, in Lepehne's blockage of histiocytes, have been inconclusive or negative or variable in different animals, enough has been accomplished to demonstrate the importance of this system as a collateral factor in pathological processes. These is, in Ashoff's opinion, "no certain instance of a purely idiopathic hyperfunction of the reticulo-endothelial system." The concept rather illustrates the view stressed by Ewing, that in profound systemic disorders, pathologic change is not always confined to one organ or system of organs, but may, in some instances, exhibit very extensive correlations.

F. H. GARRISON

THE TEMPLES OF AESCULAPIUS WITH NOTE ON INCUBATION AND THE THERAPEUTICS OF DREAMS

CHARLES L. DANA

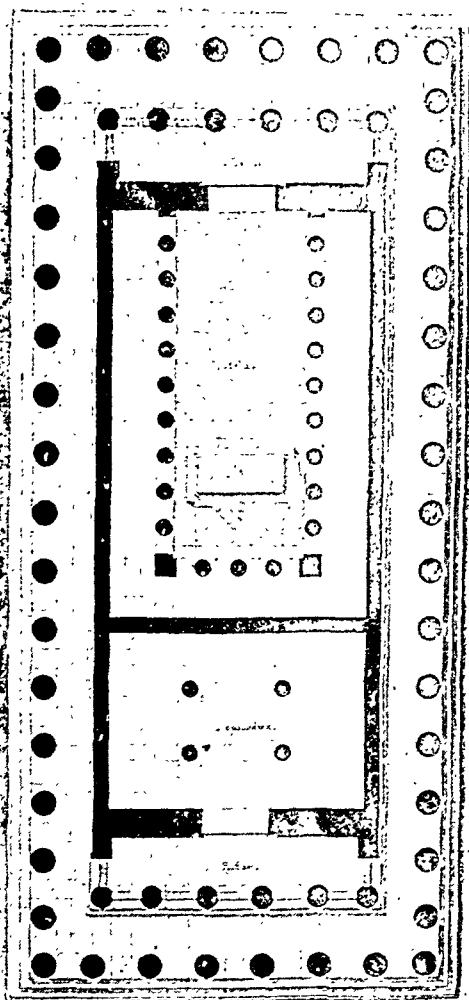
"The priesthood or 'family' of Aesculapius, a vast college, believed to be in possession of certain precious medical secrets, came nearest perhaps, of all the institutions of the pagan world, to the Christian priesthood; the temples of the god, rich in some instances with the accumulated thank-offerings of centuries of a tasteful devotion, being really also a kind of hospitals for the sick, administered in a full conviction of the religiousness, the refined and sacred happiness, of a life spent in the relieving of pain.

"In the time of Marcus Aurelius these medical dreams had become more than ever a fashionable caprice. Aristeides, the 'Orator,' a man of undoubted intellectual power, has devoted six discourses to their interpretation; the really scientific Galen has recorded how beneficently they had intervened in his own case, at certain turning-points of life; and a belief in them was one of the frailties of the wise emperor himself." From Pater's *Marius the Epicurean*, Chapter III.

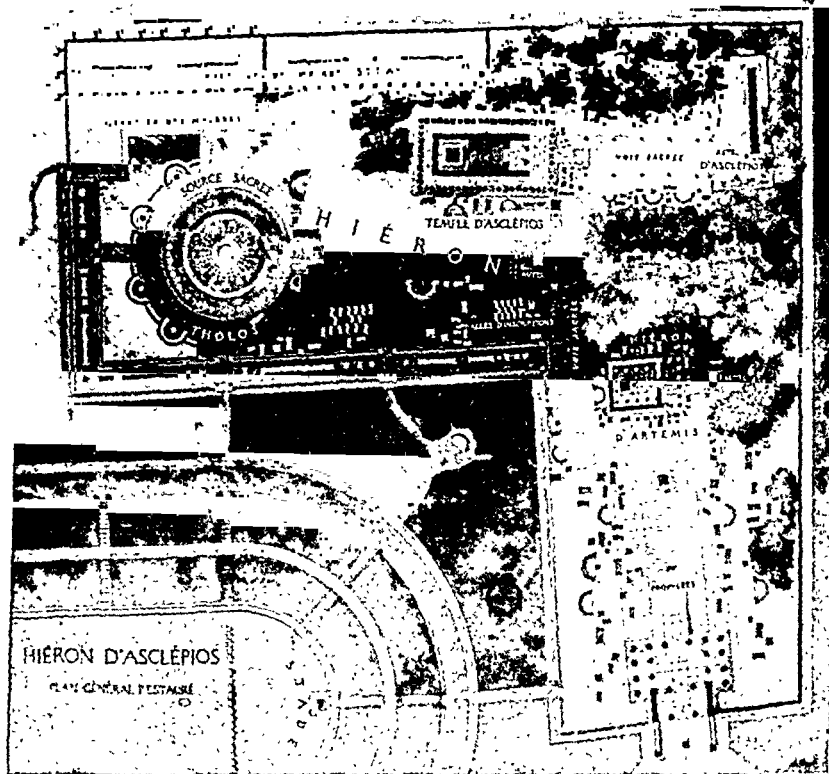
At the time of the Trojan War (presumably about 1200 B. C.), Aesculapius was only a "blameless physician" who had two sons working as surgeons in the Greek army. At some period not long after the War, Aesculapius was made the God of Medicine, and about 600 B. C. temples for his worship began to be erected. These temples grew in number and were distributed throughout Greece, Thessaly, Italy, Spain, Gaul, and even England. Their activities were continued well into the Christian era—in fact as late as 400 A. D. St. Jerome expressed his surprise that people were still worshipping at the temples of Aesculapius.

These temples were modest structures, though often architecturally fine. They consisted of only three rooms; a vestibule, a central room known as a "cella" in which a statue of the god was kept, and a room in the rear. The cella was lighted only from the roof. At the facade of the Temple there were always columns, and often columns were placed entirely round the building forming a colonnade and adding much to the beauty of the structure.

There was often associated with the Temple another building called a Tholos or rotunda. This was perhaps an administrative building in part, but it had in its center a kind of well in which were the harmless snakes.



PLAN OF THE PARTHENON.



TEMPLE OF AESCULAPIUS AT EPIDAUROS.

Dogs as well as snakes were animals associated with an Aesculapian temple. They were there partly because they were supposed to lap and cleanse the sore of the patient and partly because a dog watched over Aesculapius when he was exposed as a child by his mother Coronis.

The temples were not used as places into which people went to worship. The worshipping was done at altars outside. Temples were cared for by a group of men known as the Priests of Aesculapius, and their activities were devoted to the cure and care of the sick. The method of treatment consisted in the use of a few ordinary drugs, chiefly those promoting elimination, the use of what is known as incubation or temple sleep, and the giving of advice as to sanitary living.

The patient who came to a temple for help was interviewed by a priest who explained to him the powers of the god and dilated no doubt upon the efficacy of his work. The patient was then told to go to a sleeping porch erected near the temple and to lie there during the night. He was told that he would have certain dreams in which Aesculapius would appear, or he might even have a visit from Aesculapius himself. In the morning, he was to describe his dream to a priest, and it was interpreted in such a way as to suggest therapeutic measures in behalf of the patient. As one reads of the use of dreams (see "The Cult of Aesculapius" by Alice Walton) for diagnosis and cure by the ancient priesthood, one feels that they anticipated and greatly elaborated the present-day methods of the psychoanalysts.

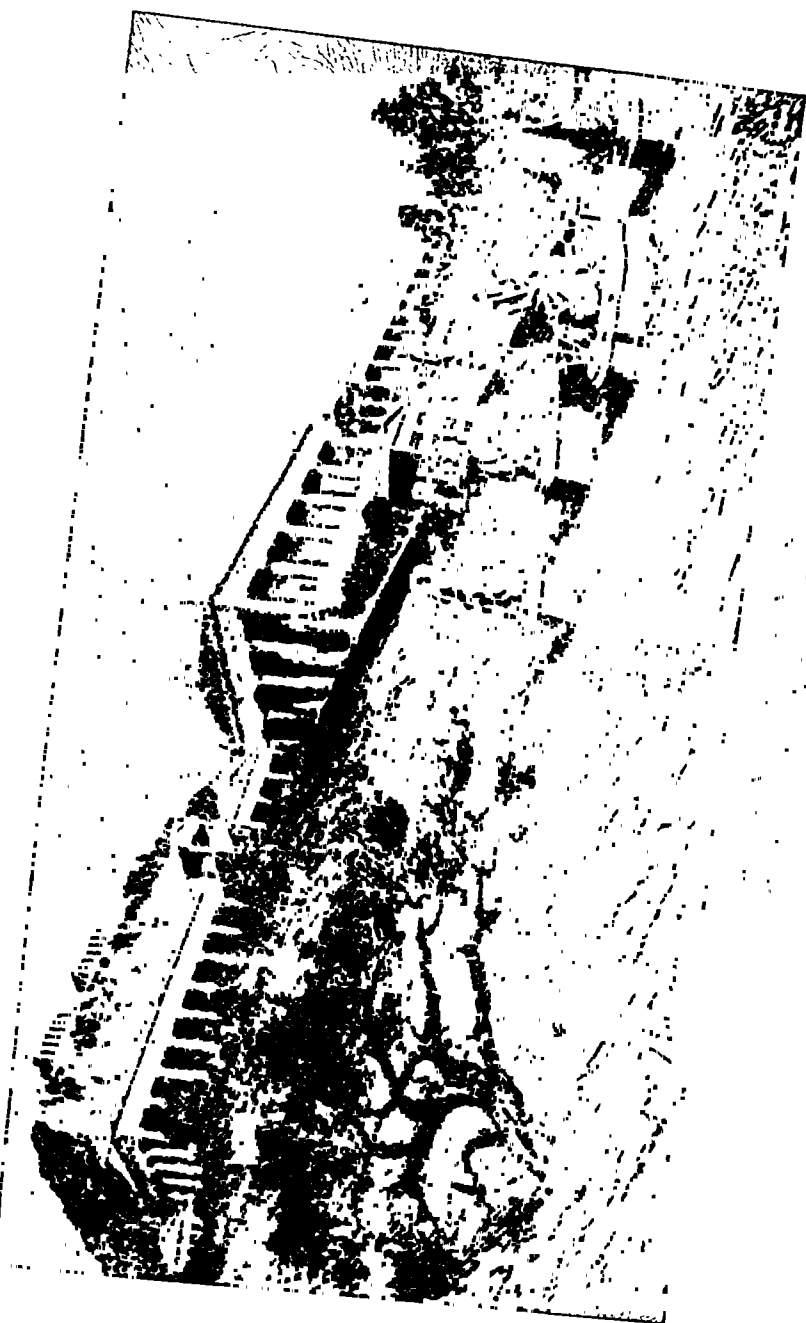
The temples, as they became popular, had associated with them these particular porches, which were open on one side, and in which the patients could sleep, but there were later also hotels erected. Often, there was another temple to some other god in the neighborhood. It seems evident that the patients were kept in the neighborhood of these temples for some period of time, and in time it became the practice to build amphitheaters in which the patients could be entertained with plays, and stadia in which were athletic sports.

Thus the temples of Aesculapius in time became a sort of institution, combining the elements of religious therapeutics with various forms of out-door entertainment.

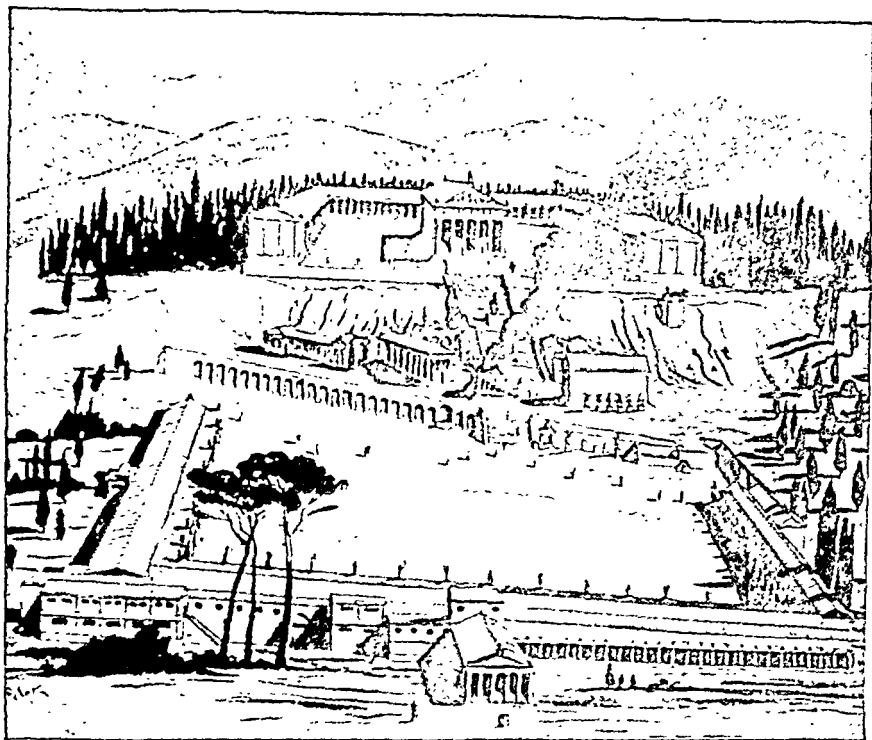
The temples were in some cases supported in part or whole by the State, but they often acquired large tracts of land and possessed a great deal of wealth.

It was customary after a patient had received and finished his treatment to present to the temple some votive offering. This would be perhaps an inscription telling of his cure or some object in the shape of the particular organ that was diseased such as a heart, a kidney or a broken leg. In this way the temples accumulated both therapeutic and clinical knowledge.

There is a difference of opinion among medical historians as to the actual therapeutic value of the temples and as to whether they really made any contribution to the progress of medicine. Some writers deny that they were of any scientific or medical importance and assert that they were centers of charlatanism and



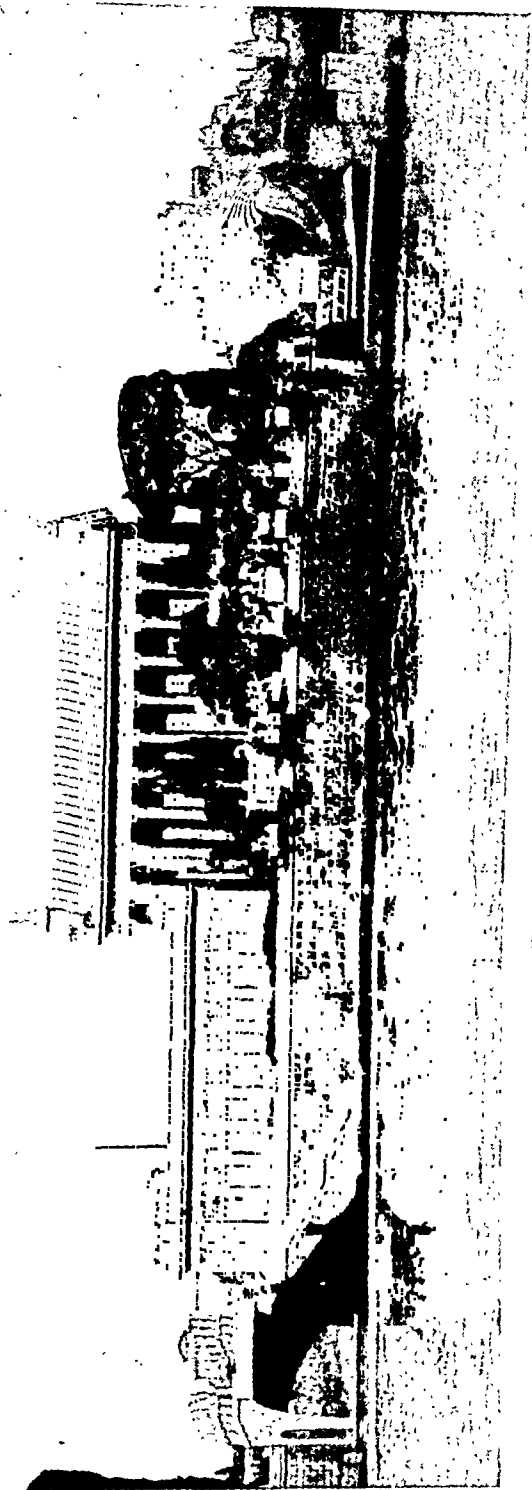
...ver, Inc.)



TEMPLE OF AESCULAPIUS AT COS.
(Courtesy of Paul B. Hoeber, Inc.)

religious fanaticism. Mr. Walter Pater in his book, "Marius the Epicurean," takes quite a different point of view. He gives a very vivid and elaborate description of an Aesculapian temple in Italy, and he expresses the view that the priests were not only sincere men and devoted to their calling but that they gave to the patients a great deal of valuable information as to the care of their lives and as to preventive medicine generally. It seems to me that it was impossible that these temples with their continual accumulation of inscriptions regarding disease and cures should not have furnished something of help to scientific medicine itself.

The group of buildings which made up the institution of the temple was surrounded usually by a hedge or a wall, and the enclosure as a whole received the name of a Hieron. The insti-



TEMPLE OF AESCULAPIUS AT ROME.

tution of the temple with all its accessions was also known as an Aesclepeia.

There were six cities in which the temples of Aesculapius became particularly celebrated. These were the temples at Cos, Cnidus, Epidaurus, Pergamos, Athens and Rome.

In recent years it has been the practice of certain archaeologists and architects to institute upon paper a so-called restoration of some of these temples. The grounds upon which the temple lay and its surroundings were carefully measured, the fragments of the ruined building were studied, and a reasonably correct idea of what the temples looked like is then produced. The most elaborate restoration has been that of the temple at Epidaurus. Pictures of this restoration were made into the form of a book with a descriptive text, and the pictures of this book have been removed and framed and now hang on the walls of the Academy of Medicine. I have a similar restoration of the temple at Cos and of the temple at Athens.

The temples of Aesculapius which prevailed through the whole of the Grecian civilization for a period of nearly one thousand years must have been something like in effect therapeutically the Christian Science churches of today. In other words, their therapeutic significance was largely one of suggestion. It is not impossible as Mr. Pater states that in many cases they made some study of preventive medicine and gave important advice regarding the warding off of disease.

Certain of the more famous temples attracted people to them just as people go to famous shrines to-day.

Bibliography. Those interested especially in this subject will find help in "The Cult of Aesculapius" by Alice Walton, Ph.D., who writes a scholarly monograph and gives a full bibliography. It is published as No. III Cornell Studies in Classical Philology. There is an excellent contribution by Dr. Richard Caton: The Temples and Ritual of Aesculapius, Hertford, Eng., 1899, also an article by Dr. Roland G. Curtin, Transactions of the American Climatological Society, 1906. I published an article entitled "The Cult of Aesculapius, his Statues and his Temples," in Vol. I of the Proceedings of the Charaka Club, 1902.

THE MENTAL AND MORAL TRAINING OF THE NORMAL CHILD—THE DUTIES OF PHYSICIAN, PARENT AND TEACHER—A CRITICAL ANALYSIS OF MODERN TRENDS AND DOCTRINES

(Abstract)

BERNARD SACHS

(Delivered before the New York Academy of Medicine, May 6, 1926)

The average child at birth—despite theories of heredity—is *potentially* a normal creature.

It is the function of the physician to grapple with the problem of preventing the development of serious mental trouble in later years.

The father must share with the mother responsibility for the raising and training of children. Too often the father sidesteps this duty because of preoccupation with his business.

The maternal instinct, tempered by experience and common sense, is the best guide for the rearing of children, although she should utilize, as most modern mothers now do in the case of feeding children, the best scientific information available.

It is a safe inference, based upon large experience, that environment (training) is more important to the child than heredity. While heredity undeniably influences physical and mental growth, and even habits, *it is safe to assume that any possible unfavorable heredity factor may be neutralized by proper training methods.*

Heredity is often held responsible for maladjustments, when educational methods (force of example, instruction, discipline) are at fault.

INFANCY

Even children of neurotic stock should *not* be pampered but trained as systematically in physical habits as other children. Mother and nurse are primarily to blame for over-stimulation of the child. No harm if infant begins to crawl or walk or talk a little later than the neighbor's child—leave it alone! Avoid psychological experiments with babies—especially mothers who are proud of their smattering of psychology.

Treat all children normally. Despite Freudian teachings, the mother should manifest toward child all the loving devotion she feels. Pay no attention to the modern catchword literature to the contrary. Although a few sexual irregularities may be traced to unwise "petting" by infants' nurses, all that is necessary is the sensible supervision of a sensible mother.

NURSERY AND PRE-SCHOOL AGE

Soon after the first year, every child should feel the weight of rightfully exercised authority—a beneficent tyranny. A sense of obedience should early be developed or the child rules the parent.

Despite Freud, this is the age to lay foundations in character training—do not bother about the sex instincts. No harm comes of such natural instincts, if the psychoanalyst would only refrain from unduly emphasizing them.

The lack of respect for authority is one of the grievous faults of our modern social life; and it is largely due to the fact that this need of respect for authority has not been inculcated in our young children. As neurologists and physicians, we can bear witness to the fact that the lack of respect for the authority of parent or teacher causes a great deal of trouble in the development of many a child that is potentially normal. There has been much idle talk about the fear of "repressing" a child, as though repression were a thing to be looked at askance; and the Freudians again grow wild over the repression of instincts, when everyone who reasons sensibly about the thing will realize that all the instincts, even the fundamental one of hunger, and certainly that of procreation, have to be repressed if the social order approved by mankind throughout the centuries is to be maintained.

With the development of speech and with the gradual development of the intellectual faculties, further difficulties arise. "Baby talk," so amusing at first, should not be encouraged. If not counteracted, its effects are apt to be lasting. Distinctness of articulation should be insisted upon by parent and teacher from the very start. The carelessness of speech that is so characteristic of the majority of individuals throughout life is a matter that deserves close attention. It is a rare treat to meet a child

that articulates distinctly. Language is acquired most easily by imitation, by repetition and by the association of words and objects. In the playroom and in the kindergarten class, through the use of appropriate toys, illustrated charts and the like, the child's normal associations and concepts are developed. All this may proceed along well-recognized and generally accepted lines.

The fear of contagious disease should not deter mothers from allowing their children to mingle freely with others. As soon as practicable, even before the kindergarten age, children should be brought into contact with one another, should be allowed to meet at play, and thus, at an early age, to develop the thought that not everything belongs to them, that others have possessions, rights and privileges equal to their own. At this period, develop the thought, "you are as good as I am" and not merely, "I am as good as you are." The latter leads to self-assertiveness and selfishness. The foundation of character is laid, at this early age, in accordance with the folly or wisdom of the parent or teacher. The systematic arrangement of the child's daily routine is of the utmost importance—definite hours of play, definite and sufficient hours of sleep, plenty of fresh air day and night—all these are conducive to a normal physical development and, above all, to the establishment of a healthy nervous state upon which the future normal mental status of the child so largely depends. Even in the matter of play, good judgment should prevail, especially in the case of children that come of neurotic stock. Boisterous play, tossing of children into the air, gymnastic stunts, prolonged running, muscular over-exertion, excessive walks should be avoided altogether.

THE SCHOOL AGE

Advice to Teachers.—As a teacher charged with the proper training of young and growing children, I would have him endeavor, first of all, to develop the homely virtues such as honesty, truthfulness, kindness, unselfishness. While the foundation for these virtues must be laid in the home, in the schoolroom they may become more deeply ingrained. No child is born with these virtues—they can and must be developed in every instance. The personality of the teacher is of the utmost importance. For a

number of years, the child's life and habits are controlled by the impressions made upon its mind by the teacher's voice, manner and precepts. We are apt to under-rate, certainly not to over-estimate, the tremendous power exercised by the teacher over the child's mind in its formative period. Our teachers evidently realize the part they play in our social organism, and anyone who, like the present writer, has taken the trouble to sit in the modern schoolroom, will be willing to pay a tribute of admiration to the marvelous qualities and to the personality of many of our present-day school teachers. The parent can, as a rule, well afford to support the efforts of the teacher who, nine times out of ten, has far greater understanding of the child's needs than has the parent.

I do not applaud making the child the subject of pedagogical experiment. I cannot accept the suggestion that the schoolroom should ever be regarded as a psychological and physiological laboratory. The normal child benefits by the rational discipline of the schoolroom—silence at proper intervals, quiet during instruction, respect for authority—*no child is ever harmed by it*. Schoolroom discipline is the greatest boon to the nervous, restless child who is either neglected or "nagged" at home. Bedlam let loose, of which some modern classrooms remind one, is a pedagogical failure.

Many times children brought for examination as to their mentality were found normal—the school "method" was at fault. Many normal children find the method of studying words by "visualization" more difficult than the older and traditional method. Changes in method, not only in teaching words but in other subjects, have frequently removed the cause of worry as to a child's "mentality."

PUBERTY AND ADOLESCENCE

This is often a troublesome period. The developing bodies of boys and girls bring into active consciousness situations connected with sex. The parent cannot, and should not try to, avoid his responsibility. The *inquiring* or troubled child should be told about the mystery of birth and the differences between sexes, and the explanation should draw freely on the analogy between plant

and animal life. It is harmful to permit this knowledge to come from evil-minded persons or comrades. The "advanced" mother is not justified in anticipating the child's natural inquisitiveness—to do so is to foster premature development of sex instincts. Much mischief has been done in this way. When the proper time arrives, the necessary information should be given in such a way as not to over-stimulate the sex instinct and should be accompanied by the warning, given in most emphatic terms, that the sex instinct, like all other instincts, must remain under the control of the well organized, well behaved human being.

Normal children of both sexes should be allowed, up to the age of ten or eleven years, to associate with one another in unconcerned fashion. Consideration should be shown the opposite sex; less roughness in play on the part of the boy will help to develop in him such desirable traits of character as gentleness towards, and respect for women, which, in spite of universal suffrage and equal rights, the gentler sex is entitled to receive. But boys are to be boys, and girls, girls. The more virile character of play and sport that the boy or youth is expected to develop calls for more intimate association between members of each sex group. The form of play and the play associates should be watched and supervised just as carefully as are the school work and the school-mates of one's child. Play and sport are the great outlet for the superabundant energy of boys and girls at the very time when the sex instinct also begins to assert itself in a very positive way. Outdoor (camp) life will do much for boys and girls between the ages of nine and fourteen years. The Boy Scout movement is to be commended warmly for its physical and moral effects. Parents and teachers should take their children or pupils into the country whenever possible. Communion with nature cannot begin too early. The growing boy or girl will fare better, by walking up and down hill, than by dancing according to the latest jazz strain.

In the early training of their children, both parents have equal duties and share responsibility equally. Let the physician, if in his power, remind the father of his duties, especially towards his sons. It is incredible, yet true, that mothers bring their boys to the physician for a wholesome talk when the boy (in his entire innocence, often enough) has reported his first seminal emissions

to the mother and the father did not "have the heart" to explain matters to his own son. Such an attitude on the part of the father is to be condemned utterly. The physician finds that, in most instances, a common-sense talk with the boy, assuring him that the occurrence is a perfectly natural one and may possibly recur from time to time, sets the boy's mind at rest and prevents further mischief. In the matter of all sex problems, boys should appeal to the father and girls to the mother. Sex questions should be discussed only with one's own sex. Not infrequently, mothers, unintentionally, play a very pernicious role. They excite rather than pacify sex curiosity. There may be exceptional cases (when the father is dead); but the rule holds good, and it is a very important one, that the boy, between the ages of eleven and fifteen years, should be chiefly under male guidance and girls of about the same age should receive all the information that they may require from an intelligent mother or companion.

It is surprising how innocent many fathers are of the sex habits and sex propensities of their sons. But this is only partial evidence of the lack of proper affiliation between father and son. Some recent painful experiences have shocked the community in the revelation of criminal thoughts and actions on the part of growing boys coming from well organized homes.

We physicians often find it difficult, when we recognize the abnormal trend of a youth's mind, to persuade the more "knowing" parents that there is anything wrong with the child they have learned to dote upon. In late years, the desire to have the child express itself fully and the failure to repress it in the least and to exercise any sort of discipline have been responsible for a great deal of mental and moral mischief, both in the parent and in the child. In advocating anything akin to discipline, one runs the danger of being called antiquated and unreasonable, but I, for one, still favor fostering a sense of obedience in the child toward the parent, respect for parental authority, consideration for one's neighbor; and all this can be inculcated without interfering in the least with the natural and mutual love between parent and child.

EVILS OF PSYCHOANALYSIS

The vital problems of the adolescent period have been made more complex by the scattering among the laity of the doctrines

preached by the psychoanalysts. Freud's influence has resulted in forced attempts to reduce all action to hidden sex impulses or motives. Dreams have been "interpreted" in the most utterly absurd fashion. Much Freudian "analysis" is practiced for the benefit of the practitioner but to the detriment of the young victim. I am not, at this time, interested in the fate of the adult who is willing to submit his person and his thoughts to this sort of inquiry. Unfortunately, many decent men and women, especially women, have been misled into an attitude of approval of methods which, in their soberer moods, they would have condemned utterly. The family practitioner, always eager to know of something new, has, I fear, been guilty of recommending, altogether too easily, this sort of sex study. In an unreasoning way, everything new is supposed to be worth trying.

"The interpretation of dreams on the Freudian plan is the biggest joke given out in the name of science that we have ever had." (J. J. Walsh.)

"Psychoanalysis is more of a religion than a science—indeed, a species of voodoo religion characterized by obscene rites and human sacrifices." (Frederick Peterson.)

Critical analysis of the Freudian doctrine leads irresistibly to the conclusion not only that it is a huge joke but deprived of its fascinating claptrap and of its sexual fantasy, the psychoanalytic movement has nothing left that could recommend it to the attention of seriously-minded persons.

For a time hypnotism was supposed to be a great mystery. In the course of years everyone has come to realize that its usefulness was altogether due to the ease with which powerful suggestions could be transferred from one person to another. The public at large was for a time as violently interested in hypnotism as it is at the present time in psychoanalysis, but the hypnotic method did not remain in favor with the public. There was no special joy in being put to sleep, even by a master mind. It is much more "stimulating" to be compelled for an hour or more, many times a week, and for several months to be face to face with a different kind of master, who insists upon discussing all sorts of ticklish subjects and who suggests both directly and continuously, that the sexual factor will have to be revealed.

The psychoanalysts have made much of the interpretation of dreams and in this their minds have run riot.

To most of us, going up a flight of stairs is a rather innocent affair. In dreams the Freudians claim it signifies sexual indulgence. A house or a room has no topographic relation to the other factors of a dream—it merely symbolizes woman. If you pass from one room to another in your dreams, you are playing the part of the sultan in his harem. Never dream of a church steeple; that is symbolic of man. The serpent was formerly the emblem of immortality, possibly of juvenescence and an attribute of Aesculapius and his daughter Hygeia; but in the Freudian mythology it is a phallic sign. If you are in the woods or in a garden (in the dream or in the waking state) you are in the presence of numerous phallic signs and you are constantly thinking of them. The reason men engage in building houses or in carpentry work is from the gratification of the sexual instinct: house—woman, that is all there is to it. It is humiliating to think that as scientific men we are asked to accept this sort of thing seriously. Remember that all this talk of symbolism has the effect of suggestion and these things now do convey Freudistic meaning to men and women who formerly took unalloyed pleasure in viewing the tower of the Strasbourg cathedral or the chief portal of the cathedral at Rheims. Wherever we take up the doctrines of the psychoanalysts they seem to lead to rank absurdities. Whatever else the normal man or woman may do, beware of slips of the pen or of the tongue. Only thus will you reveal your innermost secrets. There is some truth in this. Everyone knows that the wrong word may escape if you have something else in your mind, but the trouble with the Freudians is that they insist that your mind is always filled with nasty thoughts or that you are trying to hide something. That the vocal mechanism itself is innocently at fault never enters their minds. Not long ago I heard of the action of a certain board and said that I thought there was no reason to stand on a technical legality instead of a "legal technicality." What dreadful thing was in my mind at the time, what hidden complex was suddenly revealed, what role did the libido play?

My opposition to the entire Freudian system was due, in the first instance, to the recognition of its absurd perversion of the truth and of its logical defects. But I would not have felt called upon to enter upon any public controversy were it not for the

positive harm done by the practices of the Freudians, especially in the cases of youthful individuals of both sexes. Excessive introspection has made hypochondriacs of any number of youthful neurasthenics who might very readily have been cured by many other and simpler methods.

*Abstracts of Papers Presented before the Section of Medicine,
April 20, 1926*

(a) TREATMENT OF ERYSIPELAS WITH THE SERUM
OF CONVALESCENT PATIENTS

PERRIN H. LONG

From The Fourth Medical Service, Boston City Hospital.

It has been recognized that the hemolytic streptococci are the etiological factors in the causation of erysipelas since Fehleisen demonstrated their presence in the disease. It was believed, however, that any one of the large group of hemolytic streptococci was able to produce the disease. Recently Birkhaug and Stevens and Dochez have demonstrated the specificity of the streptococcus of erysipelas by biological methods.

With the establishment of the specificity of the streptococcus of erysipelas, the value of erysipelas convalescent serum in the treatment of the disease is evident. In the Boston City Hospital we have used the convalescent serum in eight selected early cases of erysipelas. In a second series of eight early cases of erysipelas used as controls we gave normal horse serum, Dochez's scarlet fever anti-toxin or normal human serum on entrance into the hospital.

In the eight patients treated with erysipelas convalescent serum in doses of fifty to seventy-five cubic centimeters, there was a drop in the temperature to normal within twelve hours, the signs of toxic urinary disturbance cleared, the toxicity disappeared, and the erysipelas lesion did not advance. In the eight control patients the average duration of the fever was five days, and no therapeutic benefits were noted.

It has been our experience that erysipelas convalescent serum when used in adequate quantities in early uncomplicated cases of erysipelas, reduces the temperature to normal, prevents the spread of the lesion, and helps to bring about an uneventful convalescence.

(b) THE RELATION OF PROTEIN TO NEPHRITIS

HENRY JACKSON, JR.

Thorndike Memorial Laboratory, Boston City Hospital

The large number of nephritides in both hospital and private practice together with the widespread belief that dietaries high in protein are injurious to patients whose kidneys are damaged justifies a close inspection of the evidence for and against the injurious properties of proteins and more especially so since the work of Newburgh who claims that nephritis may be caused *de novo* by diets high in nitrogen.

Newburgh as a result of various feeding and injection experiments has concluded that nephritis as we see it in man may be caused by excessive protein. Other authors find little or no evidence for this theory.

In the Thorndike Laboratory we have fed normals as much as five pounds of beef at a meal without producing any notable change in the urine. We have given mild nephritides as much protein as they would eat with slightly increased albuminuria as the main result. We have fed rats a diet containing 76 per cent. protein over very prolonged periods with no renal damage resulting, and finally we have taken out one kidney from rats and then allowed them to live on a 76 per cent. protein diet for a year and more. A slight nephritis seems to be the result in this last group but the experimental series is not yet finished and definite conclusions are not warranted. It should be noted, moreover, that in this series the nitrogen output through the remaining kidney is so great that it would be virtually impossible for similar conditions to be realized in a man's everyday life. We cannot believe that protein even in excess is a common cause of nephritis in man.

The problem of how much protein should be fed a patient whose kidney is already damaged is somewhat different. Those cases in which renal injury is severe and in which the blood nitrogen is markedly elevated should be given such a diet as to reduce the protein metabolism to its lowest level. Total calories, vitamins and salts should be carefully regulated, otherwise protein starvation may ensue. Cases in which there is little or no interference with nitrogen excretion probably do as well on moderate protein intake as they do on extremely low nitrogen levels. Patients suffering from true nephrosis may possibly benefit by high protein diets. Our experience with this class of patient is small. Certainly high protein diets, as advocated by Epstein, should be used with caution and not too much enthusiasm. Finally it should be said that albuminuria and cylindruria alone do not constitute an indication for reduction of protein intake, any more than they necessarily mean nephritis. We have seen cases originally diagnosed nephritis which turned out to be malignant endocarditis, myxedema, or cirrhosis of the liver, all of which were originally given an uncalled for low protein diet. Surely there is no indication to reduce protein in these cases. A rising blood nitrogen proves that the patient cannot handle so much protein easily. It does not prove that his kidneys are being injured.

In short we could say that nephritis is probably not caused *de novo* by high protein dietaries, that severe nephritics should be given a diet calculated to reduce their nitrogen metabolism to a minimum and that mild nephritics and hypertension may be allowed to continue their dietary ways provided no gross divergence from normal is present.

(c) CORONARY CIRCULATION AND HEART DISEASE

JOSEPH T. WEARN

From the Thorndike Memorial Laboratory, Boston City Hospital.

If one reviews the history of the study of heart disease he is surprised at the very small amount of study directed toward the circulation of the heart. Until recent years very little was

known of the larger arteries and veins, and even now our knowledge of the capillaries and the Thebesian vessels is practically nil.

Spalteholz, Gross and others have shown by beautiful injections the distribution of the larger coronary vessels, and Gross has also shown the marked change that takes place in the circulation of the heart as one grows older. These studies have thrown much light upon coronary disease and particularly upon coronary occlusion.

In the Thorndike Laboratory of the Boston City Hospital I have been studying the smaller units of the coronary circulation—the capillaries and the Thebesian vessels.

By means of injections it has been possible to study the blood supply to the various parts of the heart in cats, rabbits and rats, as well as in the human heart. The blood supply is very rich, and the average count has shown about one capillary to each muscle fiber. Some very meager evidence, recently obtained, suggests that when one is at rest and the heart is beating slowly, only a part of the total number of capillaries is open, but with exertion when the heart beats faster many more capillaries open up. These findings are in keeping with those of Krogh in skeletal muscle and of Richards in his kidney studies.

A rather interesting point has come out of the experiments which is of interest in clinical heart disease. When injecting the vessels of these hearts it soon became apparent that it was impossible to get the injection material into capillaries while the heart was dilated. The larger vessels however were well injected, and subsequent study has shown that the injection material, instead of going through the capillaries of a dilated heart, returns directly to the chambers of the heart by way of the Thebesian vessels. This furnishes the explanation of the inefficient performance of a dilated heart.

The Thebesian vessels have had very little attention, but there are times when they may play a very important role in the circulation of the heart. One frequently sees at the necropsy table, advanced sclerosis of the coronary arteries, so advanced that the openings are practically closed, yet these hearts function by blood from the Thebesian vessels.

Bayne-Jones, Kerr, Gross and others have shown the existence of vessels in the valves, and the important relationship of this

fact to endocarditis is obvious. By injecting the living heart it has been possible to show a rich capillary supply in some valves as well as a very rich supply in the aortic wall.

At present we are studying quantitatively the capillary supply to the muscle of normal and abnormal hearts.

Abstracts of Papers Presented Before the Section of Obstetrics and Gynecology, May 25, 1926

(a) THE RELATION OF THE HISTOLOGICAL PICTURE
TO PROGNOSIS IN CARCINOMA OF CERVIX UTERI

ALFRED PLAUT

The variety of cell forms and histological pictures in cervical carcinoma is very great. It is extremely difficult, practically impossible to divide cervical carcinoma into a few well defined groups as Martzloff *f.i.* has done following the principles of Broders. Besides the original variety in cell forms secondary changes like fatty or glycogenic infiltration hydrops and others may influence the appearance of cells which then seem to belong to another type as they really do. Different writers use the same term for different types of cells and different types of tumors, and different names are employed for obviously identical structures. Even if agreement on these points could be reached histologic prognosis nevertheless would not be practicable. Too many other factors are at least as important as the celltype and other histological features in determining the outcome of the disease. The age of the patient, the race and many other constitutional and conditional factors known and unknown ones. Careful study of many cases in the Woman's Hospital with complete follow up for 149 cases did not show a relation between the histologic structure and the prognosis. Only the squamous cell carcinomata with marked hornification apparently are less malignant than all the other forms. Since just the hornifying squamous epithelium is reported by radiologists to be more radioresistant than other cells it becomes difficult again to establish prognosis in cases treated by radiation. This is true for all

forms corresponding to the generally accepted laws that tumor cells of anaplastic character which resemble embryonic cells are found in rapidly progressing tumors and to the other law that such cells are especially radiosensitive. The architecture of the tumors, the differences in stroma, necrosis, inflammation did not correspond to any definite clinical groups. The age factor is important especially in very young patients (no cure under 30 years) and in old patients above 65. In young patients a larger number of anaplastic polymorph tumors was found, while for the ages between 30 and 60 no marked difference existed. The number of mitotic figures in the slides from surgical material was not decidedly higher in the unfavorable cases than in the other ones. A general histologic classification not relying on any single sign but on the whole aspect of the slides did not yield a relation to prognosis for the majority of cases, but all of the 10 cases the slides of which were designated as "very irregular" ended with death before one year elapsed after onset of symptoms. No group of fat spindle cell carcinoma could be established and the cases in which the presence of such cells was noticeable were not less favorable than other ones. (For details see the author's papers which will be printed in *Surg. Gyn. and Obst.* and in *Archives of Pathology.*)

(b) ACTIVE AND PASSIVE PROTEIN SENSITIZATION IN UTERO

BRET RATNER, M.D., HOLMES C. JACKSON, PH.D., AND
HELEN LEE GRUEHL, B.A.

(From the Department of Physiology, University and Bellevue Hospital
Medical College.)

Several years ago one of us (B. R.) in studying a case of eczema in an infant obtained the history of an excessive indulgence in eggs by the mother during her period of pregnancy.

Since that time which is about five years, we have taken antepartum histories in all cases of protein sensitivity in infancy and early childhood and have found a number of similar cases. These observations seemed to indicate a probable relationship in

certain instances between what a mother ate during her antepartum period and a state of protein sensitivity in the offspring.

If a theory bearing upon such a relationship were to be voiced, we have felt it ill-advised to base it solely on the evidence of clinical investigation, and have expressly withheld any publication on this subject until some fundamental experimental facts towards its support could be advanced.

A search of the literature revealed a few experimental observations by Rosenau and Anderson, Anderson, Gay and Southard, Schenk, and Wells, on the transmission of passive sensitization from mother to offspring. These though of great importance to a proper understanding of our subject throw light on but part of our problem.

We desired to actively sensitize a fetus in utero, in a mother who at the time of confinement was proven to be non-sensitive. If such evidence were obtained, we believed it would be in accord with what may occur in those infants who manifest profound anaphylactic symptoms the first time they ingest some protein food, the indication being that these infants become sensitized before birth. The initial ingestion after birth would then be the second or toxic contact with the protein food taken.

The passive transfer of specific sensitization from mother to offspring might well occur as is shown by the above workers. However, it should be understood that in these instances mothers of these infants must themselves be shown to be sensitive to the same proteins, which was not the case in our groups, so that there must be two types of sensitization in utero, namely passive and active.

For the past three years we have been engaged in a study of this problem in the guinea pig, but before proceeding with a discussion of our experiments, survey of the literature bearing on the problem will make for a better understanding.

A complete discussion of the literature on 1. Placental Permeability, 2. Transmission of Protein Sensitization from Mother to Offspring, 3. Transmission of Foreign Proteins Through the Placenta, was given.

Abstract of original work:

In the study of 29 guinea pig families, in which the mothers had been injected with normal horse serum long before concep-

tion, we induced acute anaphylactic death in the offspring born of these mothers, by an injection of normal horse serum within the first twenty-four hours to a few days after birth, thus corroborating the work of others.

We have also shown this passive sensitivity of the offspring to persist as a rule for 78 days, and in one instance for 118 days. Thus for the present, we may assume that passive sensitization from mother to offspring generally lasts for about 2½ months, but may persist for even longer than 4 months.

Up to the present state of our investigation, we have shown this transfer to pass successively into the offspring of the second, third, and fourth litters, the mothers having received a single injection of horse serum before the first confinement.

In 15 families, in which the mothers were sensitized during pregnancy, the offspring, as in the former cases, showed sensitization at birth. We have not as yet demonstrated the influence that the antigen might have on the duration of sensitization in these offspring. This is under further consideration.

The foregoing experiments serve as a background for our present work. We believed that if we could actively sensitize a mammal in the uterus of a mother, non-sensitive at the time of confinement, the experimental proof thus obtained might be more in accord with the mechanism which may be present in certain of the remarkable instances of those infants born of non-sensitive mothers, who manifest profound anaphylactic symptoms when they ingest some protein food for the first time.

We have been unable to find any record in the literature of an attempt to clearly differentiate a passive transfer of antibodies from mother to offspring, from an active sensitization of a fetus in utero.

In order to accomplish our purpose, we attempted to so time the injection into the mother before confinement, as to obviate with certainty, the possibility for the establishment of antibodies before the birth of the offspring.

This was a difficult task, as one cannot easily time the date of parturition. It was therefore a question of guessing as nearly as possible, the end of a period of pregnancy, and thus make our injection within a few days before confinement. For example, we had 11 animals injected from 1 to 4 days, 18 that were injected

between 6 and 10 days, and others which were injected a longer period before confinement.

It is obvious that when an animal was born within 1 to 4 days after the mother had been injected, no antibodies could have developed and been transferred to the offspring. However, in all instances, further evidence of a definitely non-sensitive state of a family was obtained, by proving that either the mother or one of the offspring was not sensitized at the time of confinement. The remaining, or uninjected offspring, were then permitted to live for a month or more. This period of time, we believe, would suffice for the active development of antibodies—the direct result of contact of the fetus with the horse serum transferred from the mother's circulation through the placenta.

Not knowing the influence that an injection into the mother might have on the sucklings, we did not in every case, inject the mother after confinement, although in 10 families we have shown no evidence of transmission of antigen through the milk. This question is under further investigation.

The overwhelming number of these experiments resulted in an inability to produce this active sensitization in utero. These negative experiments total 26 families. In 8 families we obtained moderately suggestive results. In 3 families we obtained results that were fairly definite but not conclusive. In 1 family the results were very striking, but the period of injection prior to the confinement seemed too long to fit in with the criteria laid down above.

In view of the irrefutable fact, that antibodies pass through the placenta with regularity, the negative results that we obtained in the latter group of experiments, may be due to many factors, which at the present time cannot be answered. Among these considerations, there is the question of the length of time that it takes antigen to pass through the placenta, the question of whether this passage occurs in every instance, and the question of the ease with which the fetus is able to develop an active sensitization.

However, we believe that we have in three instances, definitely shown that a fetus can be actively sensitized in utero, and present the following experiments as proof.

Mother 541, on 10/23/25, received a 10 cc. intravenous injection of horse serum. On 10/25/25, which was exactly two days

after the injection of horse serum. this mother gave birth to two offspring. On 10/30/25, one of the offspring, five days after birth, or seven days after the mother had received her injection, was given an intravenous injection of 1 cc. horse serum. This animal remained perfectly normal. The second, or remaining offspring, on 11/20/25, was thirty-five days old. when it also received an intravenous injection of 1 cc. horse serum, and promptly died in acute anaphylactic shock. presenting typically anaphylactic lungs.

In this instance, it seems clear, that the initial injection to the offspring, must have in reality been the second or toxic dose to the primary sensitizing dose it had received in utero. The negative reaction of the first offspring, in face of the overwhelming evidence of anaphylactic death, occurring in newly born guinea pigs of sensitized mothers, indicates very strongly that the sensitivity developed by the second offspring was that of an active production of antibodies.

Mother 310, on 5/19/25, received 2 cc. of horse serum intraperitoneally. On 5/22/25 (three days later), gave birth to one offspring. As long as fifteen days after the mother's first injection, i.e., 6/5/25, we were fortunately able to show that this mother remained perfectly normal, after a 1 cc. intravenous injection of horse serum. The offspring was then permitted to live for twenty-eight days, and on 6/19/25, was given an intravenous injection of 1 cc. horse serum, and promptly died in acute anaphylactic shock. On this same day (6/19/25) the mother received her third injection of 1 cc. intravenously, and also promptly died in acute anaphylactic shock. This lends further evidence to the fact that on 6/5/25, the negative response of the mother to the second injection shows that she gave birth to her offspring before she was sensitized. (Three days as noted above is generally regarded as too short a time for the development of antibodies.)

Mother 569, on 2/22/26, received 10 cc. of normal horse serum intravenously. Forty-eight hours later on 2/24/26, this mother gave birth to two offspring. One offspring when 29 days old received an intravenous injection of 0.9 cc. of horse serum and died in typical anaphylaxis within a few minutes. The second offspring when also 29 days old received an intravenous injection

tion of 1 cc. of horse serum, showed definite evidences of anaphylaxis with partial collapse and marked dyspnea. The following day this animal was given an injection of 1 cc. horse serum intravenously and remained absolutely normal, thus showing it to be refractory.

This experiment shows that an active sensitization in utero must have taken place as the mother was injected only two days prior to giving birth to the offspring, and therefore could not have transferred antibodies.

These facts obtained in guinea pigs, we hope may suggest some possible explanation for certain instances of anaphylactic reactions in early childhood, when these individuals ingest some foreign protein for the first time. We are engaged in further studies on this entire problem.

PROCEEDINGS OF ACADEMY MEETINGS, 1926

STATED MEETINGS

May

Thursday evening, May 6.

ORDER

- I. Executive Session.
- II. Address.

The mental and moral training of the normal child (the duties of physician, parent and teacher; a critical analysis of modern trends and doctrines), Bernard Sachs.

Thursday evening, May 20.

Program presented in cooperation with the Sections of Medicine and Orthopedic Surgery.

ORDER

- I. Executive Session.

Resolution proposed at the Stated Meeting of May 6 and referred to the Council:

“*Resolved*: That Section 2 of Article III of the Constitution be amended by omitting the words ‘sixteen hundred

and twenty-five' and by inserting therefor the words 'seventeen hundred.' "

II. Papers of the Evening: A Symposium on Poliomyelitis.

- a. Is epidemic poliomyelitis preventable and does a specific form of treatment of the disease exist? Simon Flexner.
- b. Can a pre-paralytic diagnosis of infantile paralysis be made, and is there a successful specific therapy? George Draper.
- c. The orthopedic treatment of poliomyelitis, Fred H. Albee.

SECTION MEETINGS

May

SECTION OF DERMATOLOGY AND SYPHILIS

Tuesday evening, May 4.

ORDER

- I. Presentation of Patients.
 - a. Miscellaneous cases from the service of Dr. Whitehouse at the New York Skin and Cancer Hospital, Paul E. Beehet.
 - b. Cases from the Good Samaritan Clinic, Abraham Walzer, Boleslaw Lapowski.
 - c. Miscellaneous cases.
- II. Discussion.
- III. Executive Session.

Election of officers.

SECTION OF SURGERY

Friday evening, May 7.

ORDER

- I. Reading of the Minutes.
- II. Presentation of Cases.
 - a. 1. Cholecystectomy and gastrectomy for chronic perforating ulcer.
 2. Gastrectomy for advanced carcinoma.
 3. Chronic tempero maxillary subluxation.
 4. Torsion of the omentum, John H. Morris.

- b. Cases of fracture of os calcis treated by subastragaloid arthrodesis, Alan D. Smith.
 - c. 1. Torsion of the omentum.
 - 2. Traumatic rupture of the spleen—splenectomy.
 - 3. Compound fracture of the tibia involving the knee and ankle joints. Early result, John H. Garlock.
 - d. An early case of gastric carcinoma in which a roentgen diagnosis was made, William F. Honan.
 - e. 1. Enterostomy for acute mechanical ileus in a child—Recovery.
 - 2. Enterostomy for acute mechanical ileus in an adult—Recovery, Bradley L. Coley.
 - f. Two cases illustrating jejunostomy and acute ileus, Ralph Colp.
- III. Papers of the Evening.
- a. Intestinal obstruction: The clinical application of experimental studies, Harvey B. Stone, Baltimore (by invitation).
 - b. The use of enterostomy in acute ileus, Frederick T. Van Beuren, Jr.
- IV. Executive Session.
- Election of officers. The present officers were renominated at the April meeting.

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday evening, May 11.

ORDER

- I. Case Presentations.
- a. A case of extensive cerebral thrombosis, with lantern slides and presentation of pathological material, Irving J. Sands.
 - b. A case of retrobulbar neuritis followed by acute transverse myelitis, due to lead poisoning, William V. Cone (by invitation).
- II. Papers of the Evening.
- a. Gastro-duodenal ulcers and autonomic imbalance, H. G. Wolff (by invitation).
 - b. A further contribution to the psychology of the essential epileptic, L. Pierce Clark.

III. Executive Session.

Election of officers:

For Chairman, Thomas K. Davis.

For Secretary, Walter M. Kraus.

SECTION OF PEDIATRICS

Thursday evening, May 13.

ORDER

I. Reading of Minutes.

II. Presentation of Cases.

- a. Babies Hospital, one case.
- b. Bellevue Hospital, one case.
- c. Mt. Sinai Hospital, one case.
- d. Nursery and Child's Hospital, one case.
- e. Presbyterian Hospital, one case.
- f. Roosevelt Hospital, one case.
- g. St. Luke's Hospital, one case.
- h. St. Mary's Hospital, one case.
- i. Vanderbilt Clinic, two cases.
- j. Dr. Rudolph D. Moffett, one case.

III. General Discussion.

IV. Executive Session.

Election of officers. The present officers were renominated at the April meeting.

SECTION OF OTOTOLOGY

SPECIAL NOTICE

A combined meeting of the Section of Otology and the Section of Laryngology and Rhinology, with the Philadelphia Section of Otology and Laryngology will be held in Philadelphia Wednesday evening, May 19. The program will be announced later.

Election of officers:

For Chairman, J. L. Maybaum.

For Secretary, Richard T. Atkins.

SECTION OF OPHTHALMOLOGY

Monday evening, May 17.

ORDER

I. Reading of the Minutes.

II. Clinical Meeting.

- a. A case of bullous keratitis with remarks on treatment, Arnold Knapp.
- b. 1. Case of traumatic arterio venous aneurysm in the cavernous sinus, post operative result.
2. Crater shaped hole in optic disc, Henry H. Tyson.
- c. 1. Case of large scleral rupture of the eyeball due to a stab wound.
2. Traumatic hole in the macula following gunshot wound.
3. Embolism of the central artery due to specific arterio-sclerosis.
4. Case of unilateral exophthalmos occurring in a child.
5. Case of extensive pre retinal hemorrhage occurring in the macula area, Martin Cohen.
- d. Cases illustrating ultimate value of recession operations, S. A. Agatston.
- e. Sarcoma of orbit in child nine months old, Walter B. Weidler.
- f. The use of tetanus antitoxin in the prevention and treatment of sympathetic ophthalmia. Report of case, A. H. Thomasson (by invitation).
- g. 1. A case of powdered gold in both cornea.
2. A case of adenoma of the pituitary after operation, Clyde E. McDannald.

III. Executive Session.

Election of officers. The present officers were renominated at the April meeting.

SECTION OF GENITO-URINARY SURGERY

Friday evening, May 21.

ORDER

I. Reading of the Minutes.

II. Papers of the Evening.

- a. The curve of phthalein excretion, its interpretation and clinical use. A. J. Crowell, Charlotte, N. C. (by invitation).
- b. The role of specific bacteria in the production of calculus. B. H. Hager, Mayo Clinic (by invitation).
- c. Experimental and clinical proof of the value of intravenous germicidal injections in local and general infections, H. H. Young, Baltimore (by invitation); J. H. Hill, Baltimore (by invitation).

III. Discussion Opened by John H. Killian, Ph.D. (by invitation); A. B. St. George (by invitation); O. S. Lowsley; Harlow Brocks; J. Bentley Squier; J. F. McCarthy.

IV. General Discussion.

V. Executive Session.

Election of officers. The present officers were renominated at the April meeting.

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday evening, May 25.

ORDER

I. Reading of the Minutes.

II. Case Reports.

- a. Cyst of the vagina in a new born child, L. S. Rau (by invitation).
- b. Report of a case of vagitus uterinus, Frederick C. Freed.

III. Papers of the Evening.

- a. The relation of the histological picture to the prognosis in carcinoma of the cervix uteri, Alfred Plaut (by invitation).
Discussion by George Gray Ward, Robert T. Frank.
- b. Active and passive protein sensitization in utero, Bret Ratner; Holmes C. Jackson, Ph.D.; H. L. Gruehl (by invitation).

IV. Executive Session.

Election of officers. The present officers were renominated at the April meeting.

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday evening, May 26.

ORDER

- I. Reading of the Minutes.
- II. Presentation of Cases.
This meeting will be devoted to the presentation and report of cases.
- III. General Discussion.
- IV. Executive Session.
Election of officers. The present officers were renominated at the April meeting.

TESTIMONIAL DINNER TO DR. DANA

A testimonial dinner was tendered by the Public Health Relations Committee of the Academy to Dr. Charles L. Dana, its Chairman, on April 26 at the University Club of New York, in commemoration of the fifteenth anniversary of the organization of the Committee. Dr. Dana has been Chairman of the Committee from its inception.

During the dinner Dr. Dana was presented with a Greek marble head of the 4th Century B. C., from Athens.

The speaking program, which was arranged to simulate a meeting of the Committee, was carried out as follows:

1. Introductory remarks.
Dr. George David Stewart, toastmaster.
2. Reading of the minutes.
3. Report of the Executive Secretary.
Dr. E. H. L. Corwin.
4. "The role of neurology in Public Health."
Report by Dr. James Alexander Miller.
5. "The Doctor peeps at a fellow practitioner."
Report by Dr. Joseph Collins
6. "Some of the recreations of Dr. Dana in art and literature."
Report by Dr. Frederick Peterson.
7. "How it strikes a junior contemporary."
Report by Dr. Foster Kennedy.
8. Rebuttal by Dr. Dana.

LIST OF SPECIAL INTERNSHIPS OR RESIDENCIES IN CERTAIN SPECIALTIES OFFERED IN NEW YORK HOSPITALS

Medicine

- 1 Beth Israel Hospital. 6 months to 1 year. Salary.
- 1 Long Island College Hospital. 1 year. Salary.
- 1 Mount Sinai Hospital. 1 year. Salary.
- 1 Post Graduate Hospital. Indeterminate. Salary.
- 1 Montefiore Hospital. 1-2 years. Salary.
- 4 Bellevue Hospital. 1 year, 3 with salary.
- 1 Metropolitan Hospital. 1 year. Salary.
- 1 Lenox Hill Hospital. 1 year. Salary.

Surgery

- 1 Beth Israel Hospital. 6 months to 1 year. Salary.
- 1 Post Graduate Hospital. Indeterminate. Salary.
- 4 Mount Sinai Hospital. 1 year. Salary.
- 1 Lenox Hill Hospital. 1 year. Salary.
- 2 New York Skin and Cancer Hospital. Indeterminate. No salary.
- 3 New York Hospital. In private wards (Med. and Surgery). 1 year. Salary.
- 1 Metropolitan Hospital. 1 year. Salary.
- 1 Fifth Avenue Hospital. 1 year. Salary.
- 2 Bellevue Hospital. 1 year. Salary.
- 1 Montefiore Hospital. 1 year. Salary.

Orthopedic Surgery

- 1 Montefiore Hospital. 1-2 years. Salary.
- 6 Hospital for Ruptured and Crippled. 18 months. No salary.
- 7 Hospital for Joint Diseases. 1 year. Salary.
- 6 New York Orthopedic Hospital. 2 years. Salary.
- 2 Reconstruction Hospital. 1 year. Salary.

Dermatology—Syphilology

- 3 New York Skin and Cancer Hospital. Indeterminate. No salary.

Obstetrics and Gynecology, Combined

- 1 Nursery and Child's Hospital. 1 year. Salary.
- 1 Brooklyn Hospital. 1 year. Salary.
- 9 Sloane Maternity Hospital.
 - 6 for 1 year. No salary.
 - 3 Resident and Assistant Resident. Indeterminate. Salary.
- 1 New York Foundling and St. Ann's Maternity Hospital. 1 year. No salary.

Obstetrics

- 6 Bellevue Hospital.
 - 3 for 6 months. No salary.
 - 1 for 6 months. Salary.
 - 2 for 1 year. Salary.
- 2 Lying-In Hospital. Four months. No salary.
- 1 Woman's Hospital. Indeterminate. Salary.
- 1 Long Island College Hospital. 1 year. Salary.
- 4 Manhattan Maternity Hospital. Three interns for 6 months. 1 house surgeon. Salary.
- 3 Berwind Maternity Clinic. 6 months. Salary.
- 1 Harlem Hospital. 4 to 6 months. No salary.
- 1 Bronx Maternity Hospital. Indeterminate. Salary.
- 3 Jewish Maternity Hospital. 3 to 6 months or longer. Salary.
- 1 Brooklyn Hebrew Maternity Hospital. 6 months. Salary.
- 1 United Israel Zion Hospital. Indeterminate. Salary.

Gynecology

- 1 Bellevue Hospital. 1 year. Salary.
- 3 Woman's Hospital.
 - 1 Indeterminate. Salary.
 - 2 for 1 year. No salary.
- 1 Long Island College Hospital. 1 year. Salary.
- 2 Mount Sinai Hospital. 6 months or longer. Salary.
- 1 Roosevelt Hospital. 6 months. No salary.
- 1 Lenox Hill Hospital. 1 year. Salary.

Urology

- 1 New York Hospital. Indeterminate. Salary.
- 1 Roosevelt Hospital. 6 months or longer. No salary.
- 2 Bellevue Hospital.
 - 1 for 6 months. No salary.
 - 1 for 18 months. Salary last 6 months.

Pediatrics

- 6 Bellevue Hospital. 9 months. No salary.
 - 1 for 1 year. Salary.
- 4 Babies' Hospital. 1 year. No salary.
- 3 St. Mary's Free Hospital for Children. 6 months. No salary.
- 5 Nursery and Child's Hospital. 9 months or longer. No salary.
- 5 New York Infirmary for Women and Children.
 - 3 intern. 9 months. No salary.
 - 2 indeterminate. Salary.
- 2 Mount Sinai Hospital. 6 to 12 months. Salary.
- 2 Jewish Hospital of Brooklyn. 2 years. Salary.
- 3 New York Foundling and St. Ann's Maternity. 9 to 12 months. No salary.
- 2 Presbyterian Hospital. 8 months. No salary.
- 2 Lenox Hill Hospital. 6 months. No salary.
- 1 Metropolitan Hospital. 1 year. Salary.
- 1 Post Graduate Hospital. 6 months. Salary.
- 1 Fifth Avenue Hospital. 1 year. Salary.

Neurology

- 2 Bellevue Hospital.
 - 1 for 6 months. No salary.
 - 1 for 18 months. Salary.
- 2 Mount Sinai Hospital. 6 months and longer. Salary.
- 1 Montefiore Hospital. 1 year. Salary.
- 4 Neurological Institute. 1-2 years. Salary.

Oto-Laryngology and Ophthalmology, Combined

- 3 St. Luke's Hospital. 18 months. No salary.
- 2 Mount Sinai Hospital. 6 to 12 months. Salary.

- 1 Lenox Hill Hospital. 1 year. Salary.
- 3 Polyclinic Hospital. 18 months. No salary.

Ophthalmology

- 2 New York Ophthalmic Hospital. 1 year. Salary.
- 2 Post Graduate Hospital. 10 months. No salary.
- 5 Manhattan Eye, Ear and Throat Hospital. 15 months. No salary.
- 12 New York Eye and Ear Infirmary. (Ophth. and Otol.) 18 months. No salary.
- 3 Bellevue Hospital. 1 year. No salary.
- 2 Knapp Memorial Eye Hospital. 18 months. No salary.

Oto-Laryngology

- 4 Post Graduate Hospital. 20 months. No salary.
- 7 Manhattan Eye, Ear and Throat Hospital. 21 months. No salary.
- 4 Bellevue Hospital. 20 months. No salary.

Tuberculosis

- 4 Bellevue Hospital. 1 year. Salary.
- 1 Montefiore Hospital. 1 year. Salary.

Physiotherapy

- 1 Montefiore Hospital. 1 year. Salary.

Radiology

- 1 Montefiore Hospital. 1 year. Salary.

Roentgenology

- Beth Israel Hospital, 1 full time for 6 months.
- N. Y. Post Grad. Med. School & Hospital, 1 full time for 1 year minimum.
- United Israel-Zion Hospital, 1 full time for indefinite period.
- Bellevue Hospital, 2 full time for 1 year.
- Hospital for Joint Diseases, 1 part time for 3 months.
- Presbyterian Hospital, 1 full time for 1 year.
- Roosevelt Hospital, 1 full time for 1 year.

L. I. College Hospital, 1 full time for 1 year.

Mt. Sinai Hospital, 1 full time for 1 year.

Cumberland Street Hospital, 1 part full time for 2 months.

Broad Street Hospital, 1 full time for 3 months.

Gouverneur Hospital, 1 part full time for 1 year.

Jewish Hospital of Brooklyn, 2 full time for 1 year.

Brownsville & East. N. Y. Hospital, 1 part full time for 6 months.

Beth Moses Hospital (Bklyn.), 1 full time for 6 months.

City Hospital (Welfare Island), 1 full time for 3 months.

MEDLÆVAL PEST-TRACTS AND DREAM-BOOKS

Documents scientifiques du XV^e siècle. I. Remedes contre la peste. Facsimilés, notes et liste bibliographique des incunables sur la peste. By A. C. Klebs and E. Droz. 96 pp., sm. 4°. Paris. E. Droz, 1925.

II. La clef des songes. Facsimilés, notes et liste des éditions incunables. By Maurice Hélin. 100 pp., sm. 4°. Paris. E. Droz, 1925.

These exquisite keepsakes, printed on vellum paper, consist of facsimile reproductions of medical incunabula, published, at very obvious financial risk, by an enterprising young Frenchwoman, Mlle. Droz.

The first contains the *Regime* of Jean Jasme [Johannes Jacobi], written in 1357 and printed by Guillaume Le Roy at Lyons in 1476, the *Remede* of the same author, commonly attributed to Knut, Bishop of Vesteras (1461), and published by Pierre Le Dru at Paris toward the end of the 15th century, another *Remede* of Jacobi printed by Antoine Caillaut at Paris about the same time, and facsimile pages of two other *Regimes*, the first attributed to Thomas Le Forestier and printed by Jacques Le Forestier at Rouen on October 21, 1495, the other a *Regime* attributed to the physicians of Basel and printed at Lyons by Claude Nourry circa 1519. The first of these pest-tracts, a poem made up of 90 dizains, each ending in the word "epedimie," was regarded by the editors as the earliest known writing on plague. A MS. of 1357 was found in the library

of the late Baron James de Rothschild (Paris), but an earlier MS. in the Catalonian dialect, an epistle of Jacme d'Agramont (1348), was subsequently found in the Archives of Lerida. Jean Jasme, or Johannes Jacobi (*anglice* John James), the author of the *Regime* of 1357, was a member of the Montpellier Faculty, of which he became chancellor in 1364. He was physician to Pope Urban V and to the emperor Charles V, for whom he wrote a manual of medical practice (1378). A contemporary of Guy de Chauliac and Valescus de Taranta, his writings reveal the Arabist tendencies of the Montpellier school. His poem shows the tendency (novel in the Middle Ages) to associate such diseases as plague with filth, and is so like the second incunable of this collection in content that the attribution of both to the same author seems inevitable. The Salernitan *Regimen Sanitatis* has verses on the pest which suggest an interpolation from the Jacobian *Regime*. The notes and bibliography of incunabula on the pest at the end are interesting and valuable. The work is illustrated by three woodcuts, one showing the mediaeval physician receiving his patients, another depicting him at his desk with the characteristic monkish lectern, slanted at 45°, the third a blood-letting mannikin.

The second quarto of this series comprises texts of three different versions of one of the mediaeval dream-books, the *Somnia Danielis*, with facsimile reproductions of title-pages, specimen pages, colophons and woodcuts from other editions. The cult goes back to the days of Chaldean astrology, of which the *locus classicus* is Daniel II, 7: "Let the king tell his servants the dream, and we will shew the interpretation of it." As the editor points out, dream-books of this type established themselves in mediaeval Europe by way of Byzantium. They became popular in the Middle Ages, and went by such names as the "Dreams of Joseph," the "Prognostics of Ezekiel," the "Lunars of Solomon," etc. The Chaldean lore of dreams goes back, however, to the animism of savages and is even reflected in Plato's statement that dreams are prophetic visions received by the "lower soul" through the liver (*Timaeus*, XLVI, 47). Even the Australian medicine man tries to interpret dreams. Even the Siamese have dream books. Hippocrates and Galen, while admitting with the Stoic philosophers that some dreams may be

divine revelations, took the important stand that others may be pathological, indicative of diseased states of mind and body. The present editor catalogues no less than 36 separate incunabula going by the name of "Daniel's dreams." The interpretations are what we might expect: To dream of climbing a tree means you will rise in the world. To dream of washing your head means you will be out of danger. To weep in dreams means joy. As hinted in the introduction, the booklet is obviously designed to interest the psychiatrists, although the dreams specified and the interpretation thereof are somewhat different from the oneiric data of psychoanalysis. A detailed analysis of dreams and dream-books remains to be written.

F. H. GARRISON

LIBRARY NOTES

Deaths in New York in 1798-99

In the April number of the Bulletin appeared the abstract of a paper entitled, "Intimations of Public Health in Early New York" by Dr. Donald B. Armstrong. In it is stated that: "The earliest fairly reliable mortality statistical records for New York City are found in a semi-centennial table of mortality covering the period 1804-53."

We wish to draw attention to the fact that the Library possesses two rare and rather curious pamphlets which tell us about deaths in New York in its early days. The first is entitled, "A List of the Names of the Persons Interred in the Several Burying Grounds in the City of New York, and at Bellevue, and Potters-Field, from August 1 to November 14, 1798." One hundred and twenty-nine pages are devoted to alphabetical lists of names, occupation, address, and, sometimes, age of those who died. In some instances it is stated from what country the dead person came. There are one or two occasions on which the cause of illness is stated, such as "consumption." Some of the entries are quaintly worded—"Codwise George, the wench of, 341 Pearl Street," "Copp Wm. Bellevue, late one of the editors of the Gazette published at Kingston, Ulster county," "Craton Mrs. Æt. 44 decay," "M'Donald James, (the noted sportsman)

78 Vesey-street, Scotland," "Simmonson Lucy, wife of Cornelius, a black physician, Pearl near Frankfort-street," "Vanderbilt, John, of Long Island, the slave of, from the corner of Ann and George-street." At the end of the pamphlet are given monthly tables of the number of men, women and children who had died, their religious denomination, and how many had succumbed to "fever." From August 1 to November 14, 1798, the total deaths are given as 2,086, and 1,424 are stated to have been due to "fever." Finally, there is a short list of donations received by the Health Committee. A curious entry is put under date of December 17—"A jury of enquiry, held at Mr. Bardin's their fees by Mr. John Nitchie, in a cause of Lunacy, dols. 10."

The second pamphlet, entitled "Record of Death, or an Accurate List, of the Names, Places of Abode, Occupations, &c. of our Fellow Citizens, who have fallen Victims to the late FEVER, since its Commencement July 25, to October 21 as have been reported to the Committee of Health and faithfully copied from the Register Kept by the Committee," is not dated, except that the year "1799" is written below the title in an old hand. There is a list almost thirteen pages long of those who died of "malignant fever." The deaths are recorded chronologically, the names of the persons and their addresses being given. The last names on the list are "Inhabitants of this City who have died out of Town during the late Prevailing Malady." The largest number of deaths recorded were, eighteen on the 21st of September and fifteen on both the 9th and 23rd of September. The fever referred to in 1798 and 1799 was probably yellow fever. It might be noted that the inhabitants of New York possibly numbered forty thousand at this time.

These pamphlets appear not to be in the Library of the Surgeon General's Office.

A. M.

RECENT ACCESSIONS TO THE LIBRARY

Allen, H. W. Diseases of the rectum . . . Practice of ambulant proctology.

Phila. Mitchell . . . co., 1926, 148 p.

Bailey's Text-book of histology. 7. ed.

N. Y. Wood, 1925, 939 p.

Braun, M., & Seifert, O. Die tierischen Parasiten des Menschen. 6. Aufl.

Leip. Kabitzsch., 1925, 608 p.

Carter, H. S. Diet lists of the Presbyterian Hospital, N. Y. C. 3. ed.

Phila. Saunders, 1926, 173 p.

Chandler, A. C. Animal parasites and human diseases. 3. ed.

N. Y. Wiley, 1926, 373 p.

Ciampolini, A. L'organizzazione della assistenza curativa agli infortunati del lavoro.

Firenze. Barbèra, 1926, 238 p.

Cohn, A. Die Ethik als Problem der sozialen Zahnheilkunde.

Leip. Barth, 1925, 76 p.

Cole, S. W. Practical physiological chemistry. 7. ed.

Cambridge. Heffer, 1926, 479 p.

Collet, F. J. Précis de pathologie interne. Tome 1.

Paris. Doin, 1926, 1106 p.

Colwell, H. A., & Wakeley, C. P. G. An introduction to the study of x-rays and radium.

Lond. Oxford pr., 1926, 203 p.

Contributions to ophthalmic science, dedicated to Dr. Edward Jackson in honor of his seventieth birthday, Mch. 30, 1926.

Menasha, Wise. Banta . . . co., 1926, 319 p.

Courmont, J. Précis de bactériologie pratique.

Paris. Doin, 1926, 1259 p.

Crile, G. W. A bipolar theory of living processes.

N. Y. Macmillan, 1926, 405 p.

Dale, H. H., Drummond, J. C. [et al.]. Lectures on certain aspects of biochemistry.

Lond. Univ. of Lond. pr., 1926, 313 p.

Darwin, L. The need for eugenic reform.

N. Y. Appleton, 1926, 529 p.

- Easterbrook, C. C. Mental invalids.
Edinb. Oliver, 1925, 86 p.
- Fisher, A. G. T. Manipulative surgery.
N. Y. Macmillan, 1926, 168 p.
- Goepp, R. M. Nurses' state board questions and answers.
Phila. Saunders, 1926, 373 p.
- Goodnow, M. The technic of nursing.
Phila. Saunders, 1926, 452 p.
- Hajek, M. Pathologie und Therapie der entzündlichen Erkrankungen der Nebenhöhlen der Nase. 5. Aufl.
Leip. Deuticke, 1926.
- Harris, W. Neuritis and neuralgia.
Lond. Oxford pr., 1926, 418 p.
- Hauer, A. Das unreine Blut.
Leip. Kabitzsch., 1925, 73 p.
- Heatherley, F. Modern methods in the diagnosis and treatment of heart disease. 2. ed.
N. Y. Wood, 1926, 269 p.
- Hintze, K. Sexual- und fortpflanzung Hygiene.
Leip. Kabitzsch., 1925, 131 p.
- Kilduffe, R. A. The clinical interpretation of the Wassermann reaction.
Phila. Lea, 1926, 203 p.
- Kraft, G. Erinnerungen an Johannes von Mikulicz und Karl Schönborn . . .
Leip. Barth, 1926, 84 p.
- Lange, F. G. Handbook of safety and accident prevention.
N. Y. Eng. magazine co., 1926, 512 p.
- Lansing, M. F. Great moments in science.
Garden City. Doubleday, 1926, 265 p.
- Le Calvé, J. Y. N. L'œdème.
Paris. Masson, 1925, 648 p.
- McAdie, A. Man and weather.
Cambridge. Harvard pr., 1926, 99 p.
- Mach, E. The principles of physical optics.
Lond. Methuen, 1926, 324 p.
- Morse, F. H. Low volt currents of physiotherapy. Physics, effects, technic.
Bost. Gen. x-ray co., 1925, 117 p.

- Nagelschmidt, F. Lehrbuch der Diathermie. 3. Aufl.
Berlin. Springer, 1926, 373 p.
- Page, C. M., & Bristow, W. R. The treatment of fractures and dislocations in general practice.
Lond. Oxford pr., 1925, 279 p.
- Perkins, G. The diagnosis, treatment and end results of tuberculous disease of the hip joint.
Lond. Oxford pr., 1926, 118 p.
- Reinecke, U. Physiological incompatibilities in dental surgery.
V. 1.
Cape Town. Townshend . . . 1923.
- Rignano, E. Biological memory.
Lond. Kegan Paul, 1926, 253 p.
- Roussy, G., & Bertrand, I. Travaux pratiques d'anatomie pathologique. 3. éd.
Paris. Masson, 1924, 264 p.
- Sal Lence, D. G. Refrazione oculaire.
Napoli. Idelson, 1925, 198 p.
- Soldan, C. N. P. Al servicio de la higiene Americana.
Lima. Ref. med., 1925, 160 p.
- Stein, M. F. Water purification plants and their operation.
3. ed.
N. Y. Wiley, 1926, 316 p.
- de Tarnowsky, G. Emergency surgery.
Phila. Lea, 1926, 718 p.
- Textbook of the practice of medicine.
Lond. Oxford pr., 1926, 1828 p.
- Thalbitzer, S. Emotion and insanity.
Lond. Kegan Paul, 1926, 127 p.
- Thom, C., & Church, M. B. The aspergilli.
Balt. Williams, 1926, 272 p.
- Thomalla, C. Innere Sekretion.
Leip. Kabitzsch., 1925, 107 p.
- Tobey, J. A. Public health law.
Balt. Williams, 1926, 304 p.
- Transactions of the American academy of ophthalmology and oto-laryngology, 1925.
- Transactions of the American climatological and clinical association, 1925.

Transactions of the American hospital association, 1925.

Transactions of the American surgical association, 1925.

Waldstein, L. The subconscious self.

N. Y. Scribner, 1926, 171 p.

Wheeler, R., & Wheeler, H. Talks to nurses on dietetics and dietotherapy.

Phila. Saunders, 1926, 184 p.

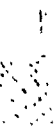
Zenner, P. Sex education.

N. Y. Appleton, 1926, 133 p.

DEATHS OF FELLOWS OF THE ACADEMY

Alexander Duane, M.D., B.S., 143 East 35th Street, New York, N. Y., graduated in medicine from the College of Physicians and Surgeons, New York City, in 1881; elected a Fellow of the Academy April 4, 1901; died June 10, 1926. Dr. Duane was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the American Ophthalmological Society, a member of the American Academy of Ophthalmology & Oto-Laryngology.

Carlos Frederick MacDonald, M.D., Central Valley, N. Y., graduated in medicine from University & Bellevue Hospital Medical College in 1869; elected a Fellow of the Academy May 5, 1904; died May 29, 1926. Dr. MacDonald was a Fellow of the American Medical Association, a member of the American Psychiatric Society, a member of the New York Psychiatric Society and Consulting Physician at Manhattan State Hospital.



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TABLE OF CONTENTS

Editorial:

The reticulo-endothelial system: FIELDING H. GARRISON	339
The temples of Aesculapius: CHARLES L. DANA.....	344
The mental and moral training of the normal child: BERNARD SACHS	352

Abstracts of papers delivered at section meetings:

Section of Medicine, April 20th: DRS. LONG, JACKSON, WEARN	360
Section of Obstetrics and Gynecology, May 25th: DRS. PLAUT, RATNER, JACKSON and MISS GRUEHL.....	364
<i>Proceedings of Academy meetings, May, 1926</i>	370

Public Health Relations Committee:

Testimonial dinner to Dr. Dana	376
--------------------------------------	-----

Committee on Medical Education:

List of special internships or residencies offered in New York hospitals	377
---	-----

Book Review. Medieval pest-tracts and dream books:

FIELDING H. GARRISON	381
----------------------------	-----

Library Notes:

Deaths in 1798-99	383
Recent accessions to the Library	385
Deaths of Fellows of the Academy	388

THE NEW ACADEMY OF MEDICINE

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DECEMBER, 1926

No. 12

MAUDE ABBOTT'S OSLER MEMORIALS¹

When Cushing's Osler appeared, there were voices prophesying that a work of such portentous length would seldom be read from cover to cover, although its author had forestalled this criticism, in some measure, by his modest view of his performance as *mémoires pour servir*. The full length biography, of the type of Boswell's Johnson, Carlyle's Frederick, Thayer's Beethoven or Max Kalbeck's Brahms is, in fact, a reference book or store-house of information, as well as an authenticated narrative, designed for a certain number of interested readers. Complete and continuous perusal of these major biographies depends, as the mathematicians say, upon "the extent of our interest in the subject." The appearance of Amy Lowell's Keats, close upon the heels of Cushing's Osler, was greeted with intense interest by all genuine admirers of the poet. The successive volumes of Monypenny's Beaconsfield have been followed, line for line, by students of English politics during the Victorian era. But for the general run of readers, biography is undoubtedly more apt to be read in the shape of the single, compact handy volume. As a rule, such biographies have been either conventional, laudatory narratives, beginning with Plutarch's Lives, or frankly scandalous chronicles, as in the back-stairs gossip of Suetonius or Brantôme. The species of British biography defined by Carlyle as "mealy mouthed" is said to have originated with Sprat's Life of Cowley (1668), in which all personal anecdotes, contemporary sidelights and local color are submerged in favor of trite moraliz-

¹ Bulletin No. IX of the International Association of Medical Museums. Sir William Osler Memorial Number. Appreciations and Reminiscences. Montreal, privately issued, 1926.

the chorus of victory after the battle of Salamis," and of the starveling clinical laboratory which he then had: "It was as if Beethoven were playing in a hovel." Of these days, Leidy gives some piquant details. When the students failed to find the focus of infection in an autopsy revealing multiple renal and splenic infarctions, Osler wheeled suddenly upon a culprit with: "You reprobate; you never opened the tympanum!" In another case (melanotic sarcoma of liver and skin), he sang out: "You never examined that choroid membrane!" When Leidy remonstrated with him about his therapeutic nihilism in cardiac cases (his placebo was Compound. Tinct. Cardamon), Osler replied: "Ah Leidy, bless your soul, how many lives will be saved; only, only think of the deaths from the indiscriminate use of digitalis!" And on another occasion: "Well, my dear fellow, if it will ease your mind a bit, put on a poultice." While there is much pother about therapeutic nihilism throughout the book, it is plain that Osler's view of polypharmacy as a "double-edged sword" was sound, as indeed it did anticipate Schmiedeberg's and Cushing's wholesale slashing of the pharmacopœia.

Passing to the clinic, Helen MacMurchy tells of Osler's comment on a student reporting a case of convulsive tic with copro-lalia: "You can judge for yourselves how bad the language was from the fact that a medical student noticed that it was bad"; and of his tact in putting an impoverished chlorotic girl at ease before examining her. With the prescription came the inevitable historic note:

"What shall we give her, Miss T? Yes—Blaud's pills, who was Blaud? . . . Just shows our imbecility as physicians that we have a remedy for chlorosis and plenty of us won't use it. Same thing in malaria; quinine cures malaria and yet we have case after case coming into this hospital, having been treated with everything else."

Marian Osborne tells of Osler's immense popularity with children and of his unusual consideration for the poor. On one occasion he gave first money, then his own overcoat to a seedy old beggar, who was obviously predestined to die of drink and who subsequently bequeathed to young Osler his hob-nailed liver and—the overcoat. With an old Scotch woman, who was making "a devil of a row" before going under operation, Osler tried

a deft *lusingando*: "Poor old Scotch body; thole it a bit, thole it a bit." "O Sir," she cried, "I haven't heard sic a talk since I parted frae Edinboro—Bless you, I maun try to stop from greeting and grizzling." When asked "why do you whistle?" as he left a moribund case, Osler made a grimace and said sadly: "I whistle that I may not weep." We are familiar with Van Wyck Brooks' brilliant exegesis of the case of Mark Twain among the miners—that his subsequent output as a professional humorist was a defensive reaction. Osler's practical jokes were, in Cushing's view, defensive reactions, the tricks which agile minds and keen sensibilities somehow play upon themselves. Burr gives some examples. On one occasion Osler reduced to tears a high-strung lady superintendent, who was desperately smitten with him, by flourishing in her face a skewer, which he had carefully invested with cobwebs, as outstanding evidence of the poor policing of the hospital. He told Burr that he could never become a neurologist unless he mastered Meynert's Psychiatry. When Burr at length reported in despair that he could not comprehend it, there came the twinkling reply: "Do not let that worry you; nobody else can." He chaffed Burr unmercifully about a neurasthenic patient whom he himself declined to see and who subsequently recovered under Weir Mitchell. "Had I not loved him with the love of a hero-worshipper," Burr adds, "I should have hated him, but I did not." The worst of Osler's play-boy impulse was that it engendered a certain amount of trite imitation, nowise grateful to those already fed up with the superiority complex of the average American. The chloroform episode, with such boomerang effects as the impersonation of Osler on the stage (with a jug of chloroform) by Harry Bulger, a brown-eyed Chicago comedian, or the comment of Lady Osler herself ("leading the shattered idols home"), proved *un peu raide*, even for Osler, who had been otherwise game enough when hoaxed on occasion by Welch. Yet nothing more surely reveals the great and thoughtful physician than the main contention of Osler's farewell address of 1905 (The Fixed Period), viz., that "after the sixtieth year, it would be best for the world and best for themselves if men rested from their labors." Thirty years before, Weir Mitchell (in "Wear and Tear") had scored the

city-bred American as a potential neurasthenic through his everlasting concern about business. Dickens, in *Chuzzlewit*, had even asserted that he is not as busy as he pretends to be. In many an Ade fable, the tired business man, retired from business, finds himself bored to death through his total incapacity to enjoy the fruits of well-earned leisure. Yet no one took these things as seriously as the chloroform joke and the U. S. Army retires its officers at 64. When Osler turned his face to Oxford, he was himself tired to extinction of the exactions and importunities of a huge consultation practice, and with health impaired by a serious attack of influenza, he was perhaps beginning to feel the grasshopper as a burden—

“Can’t one even die in peace,
As one shuts one’s eyes on youth?”

It was at this turn in his life that I began to sense the real Osler. I am thankful to say that I did not find him the aureoled saint of Max Broedel’s Johns Hopkins cartoon. “A saint,” as Gibbon observed, “is either above or below the present world,” and Osler, like Cardinal Newman weeping by the gateside, was intensely human. He reminded me rather of pictures of Sir Richard Burton, whom he resembled slightly *en miniature*. Like Burton, he had undoubtedly tried out all phases of human experience but with the difference that he was able to “hold fast to that which is good” without either hardness or brutality. As a boy, Osler was the traditional clergyman’s son, a bit of a *Schlingel*. The mature man had already attained his mental as well as his physical age, was armed in every fibre against illusion and actually dissipated energy in evading the pest of Oslerolatry. His utmost ingenuity was expended upon the lifelike perpetual escape from monopolizing bores, even to the extent of ignoring a whole shipful of colleagues to devote himself exclusively to the children on board or travelling incognito, as “Edgerton Y. Davis,” whom he impersonated on occasion as a subscriber and contributor to medical periodicals and even carried over Niagara Falls in an obituary notice. When Agnew asked Osler (then a bachelor) why his wife did not come to church, he replied: “Mrs. Osler is a Buddhist.” He might have laughed at the story of demon Burton towering above the bewildered curate with such polite small talk as “My father was the most *moral* man I have

ever known" and "Nice to be able to think well of one's parents, you know!" Osler's first manner toward me (a total stranger in a public office) was a thought crabbed (he himself spoke of his "crabbed Monday morning face" in the Sargent painting) and my reaction was frankly the Scotch thermodynamic device of ordinary self respect—"lower the temperature." Conversing one day in an ordinary tone, he suddenly gripped my shoulder and holding me at arm's length, looked at me fixedly, his eyes filled with tears. I understood, and from that hour have never known, among my elders and betters, a more considerate, sympathetic, thoughtful and inspiring friend. If I mention this anecdote, it is not to thrust myself into the picture, but to illustrate his wonderful power of gripping people to himself as with hooks of steel and making them his friends for life. It is a gift which few of us possess.

It is surprising to learn from some of Dr. Abbott's contributors that Osler's earlier manner in the clinic was halting and uncertain, but this only means that he was truly modest and regarded his subject as more important than himself. In his Beaumont address at the Army Medical School (1894) and in his ringing defense of Congress at the Fletcher banquet in Washington (1906), his delivery was fiery, rapid in tempo, of unfailing surety, and while disdaining oratorical flourishes, carried his audience along and held their attention to the end. The Celtic ring in his voice occasioned the whisper: "He is Irish." But the Celtic strain in Cornwall can be sensed as readily in the steerman's song in Tristan as in the old catch:

"And shall Trelawny die? And shall Trelawny die?
Then twenty thousand Cornishmen shall know the reason why."

A word as to a slight error in the bibliography. The statement on p. 575 that I delivered the address at the Oxford presentation on June 11, 1919, is obviously erroneous. Even had so great an honor been in any way mine (*salvum sit quod tango*), it was physically impossible, for the reason given by Sir Burke Roche, viz., that "a man couldn't be in two places at one and the same time, barring he was a bird." Jestings aside, the few trifling errata in these splendid memorials will now be corrected in a well-deserved second edition.

F. H. GARRISON

THE SURGERY OF GASTRIC AND DUODENAL ULCER

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(Delivered before The New York Academy of Medicine, November 4, 1926)

First let us take a hasty glance over our subject touching the high points so to speak, before undertaking a more detailed consideration of those particular phases of it that more intimately concern us as surgeons.

The first description of the pathology of gastric ulcer was published by Baillie in 1793, but inasmuch as it was not accompanied by any clinical data, it had little effect in stimulating interest in the condition. Abercrombie, in 1824, described much of the symptomatology of gastric ulcer, but did not differentiate simple ulcer from ulcerated carcinoma. The credit of having first recognized the difference between ulcer of the stomach, carcinoma and ordinary gastritis belongs to Cruveilhier, who, between 1829 and 1835, published accurate descriptions of the anatomy, the clinical course and the treatment of gastric ulcer. Following Cruveilhier, Rokitsky, in 1839, described the anatomy of the condition, basing his description on 79 cases collected and studied by him. At the time that Dr. Welch wrote his masterly account of "Simple Ulcer of the Stomach" for Pepper's System of Medicine, published in 1885, he found medical literature abounding in articles upon this disease. Some of the more important contributions were those of Gatch on symptomatology and diagnosis, Virchow on etiology, the statistical analyses of Brinton, and the articles of Ziemssen, Leube, Budd, Chambers, Habershon, Fenwick and Fox. Of the enormous number of articles dealing with this condition and published since 1885, very few have advanced materially our knowledge of the pathology of the condition. Due largely to their divergence from commonly accepted ideas, the publications of Wilson and MacCarty have directed attention to the development of carcinoma in simple ulcers. The theory of bacterial origin has received renewed support from the work of Rosenow. The development of surgical technique has increased greatly the extent of surgical treatment, and also has been the basis for the great amount of work on the experimental production and treatment of this condition.

Following their experiments on dogs, Gussenbauer and von Winiwarter, in 1876, had proposed pylorectomy. These experiments of Gussenbauer and von Winiwarten are generally supposed to have been the first recorded operations upon the stomachs of dogs, but such is not the case. Merrem, of Giessen, in a monograph published in 1810 writes as follows:*

“Extirpation of the pylorus. A certain famous professor, highly respected and renowned among the medical profession in Philadelphia, was greatly concerned by the premature death of Dr. Middleton, whose death was caused by the hardening and narrowing of the lower orifice of the stomach. He therefore concentrated his attention on the most effective remedy for this very dangerous malady. The terrible sufferings of his beloved friend could not be removed nor even relieved, although the most approved remedies of the time were used. Nothing therefore was left other than to remove the cause of the disease, that is, to extirpate the pylorus. This operation seemed involved in such serious danger, that at the time his friend would not perform it. Two years before he had had experiments made on several dogs, some of them in perfect health, one a puppy, and they all terminated fatally. (I attribute the blame for this to the difficulty of the operation and to lack of surgical skill.) He used the cruciform section, the perpendicular part of it extending from the xiphoid cartilage of the sternum to the umbilical region. The prolapsed intestine was put back in half an hour, the duodenum sheathed in the stomach, the liver often injured, etc., etc.; in the last case, the puppy, he fitted the end of a certain intestine (not named) into the other (intestine) with the thickness of his thumb, so that the gall bladder and the pancreas would necessarily have been broken, or at least obstructed. None of these animals so badly treated lived longer than twenty-four hours afterward. Not deterred by the fatal outcome, I have tried extirpation of the pylorus on several dogs, one of which recovered.”

Pean, in 1879, and Rydygier, in 1880, had unsuccessfully attempted the operation on human subjects. Billroth, in 1881, successfully removed a pyloric carcinoma, and his procedure of suturing the remaining portion of the stomach to the duodenum,

* Certain surgical observations of experiments on animals illustrated by facts. Daniel C. T. Merrem. Giessen, 1810.

end to end, became known as the "Billroth I" method. In 1885, he used gastro-jejunostomy to restore continuity following gastric resection. This became known as the "Billroth II" method. In von Hacker's article describing this procedure, the suggestion was made of termino-lateral gastro-jejunostomy, which was subsequently first performed by Kronlein. To this operation and the subsequent slight modifications of its principle have been attached, in turn, the names of von Hacker, Kronlein, von Mikulicz, von Eiselsberg, Hofmeister, Reichel and Polya.

A plastic operation on the pylorus was first performed by Heineke in 1886, followed independently by Mikulicz in 1887. Kocher's end-to-side gastro-duodenostomy following pylorectomy was reported in 1891. Lateral gastro-duodenostomy was suggested by Jaboulay in 1892, and the first report of its clinical application was made by Henle in 1898, who states that Mikulicz had suggested the method. This operation was the precursor of the method of gastro-pyloro-duodenostomy, which was reported by the speaker in 1902, and now known as "pyloroplasty." Dissatisfied with the disturbed physiology presented by the Billroth II group of anastomoses, and by their tendency to cause secondary ulceration, von Haberer, in 1922, and the speaker, in 1924, working independently, reported their experiences with the Billroth I method modified into an end-to-side gastro-duodenostomy.

In Dr. Welch's article of 1885 there are nine pages devoted to the medical treatment of gastric ulcer, with only a short paragraph on surgery devoted largely to the relief of pyloric stenosis. At that time, it was thought that the treatment was entirely medical, but that cicatrization of the ulcer by no means always cured it in the clinical sense. As a result of adhesions and scar tissue contraction, serious disturbances of the function of the stomach might follow the repair, the most important of which was stenosis of the pylorus. Dr. Welch found three successful cases in four recorded attempts at extirpation of a stenosing ulcer of the pylorus. He ventured the opinion that the resection of gastric ulcers which resist all other methods of treatment, and especially those which cause progressive stricture of the pylorus, might be considered as a justifiable operation. He noted, however, as extravagant and unwarrantable the bold suggestion of Rydygier, who advocated exploration and resection of an ulcer from which hemorrhage threatened to be fatal.

It is interesting to compare this with our views to-day, forty years after the beginning of gastric surgery. It would seem as though the greatest influence had been exerted by the tendency to regard every ulcer as a potential carcinoma, and a source of grave danger from hemorrhage, perforation or obstruction. This, combined with the advances made in diagnosis by means of the X-ray, and the establishment of a characteristic clinical syndrome, has led to the use of surgery in ulcers before the stage of cicatrization has been reached, and in ulcers elsewhere than at the pyloric orifice. The idea that the degree of gastric acidity exerts a marked influence on the healing of ulcers has distinguished a group of surgeons who advocate extensive resection of the stomach beyond the ulcer area from those surgeons who are content with more conservative measures. Dr. Welch's ultra-conservative view on the exploration and resection of bleeding ulcers, finds many followers to-day who look upon such a procedure as inferior to the benefit conferred by absolute rest, diet and appropriate medication.

But here, as elsewhere, it will be found that the large majority of surgeons of experience and mature judgment prefer to follow the middle course. Avoiding the two extremes, the one of consistent opposition to any form of operation, as advocated by some internists, and the other, the indiscriminate resection of large portions of stomach wall; suiting the operative procedure to the indications in the individual case, they as a rule make use of the more conservative types of operation, reserving the more mutilating methods for exceptional cases.

The diagnosis of gastric and duodenal ulcer lies largely within the province of the internist, as he is the one who first sees the case, but it is a *sine quo non* of good surgery that no operation should be performed for this affection, or any other, for that matter, without the surgeon, who has the responsibility of the operation, seeing to it that a careful history has been taken and an exhaustive physical examination made before undertaking any operative procedure. This will eliminate most of the conditions which may present the clinical picture of ulcer and with which it may be confused. Laboratory examinations will prove of great assistance in further eliminating other conditions which may obscure the diagnosis. Roentgen ray examination contributes

much in the diagnosis of gastric disease. When carefully made, the positive or negative evidence thus obtained by the experienced observer is of great value. However, it is not infallible, in fact it may at times be distinctly misleading, and should be considered only as an important link in the chain of clinical evidence. Thus the diagnosis of gastric and duodenal ulcer is based on the careful accumulation and interpretation of information derived from many sources. It is only by this thorough examination in which the heartiest cooperation between the internist and the surgeon is absolutely essential, that the best results, so far as diagnosis and treatment are concerned, are to be obtained.

The four principal complications of gastric ulcer, the first three of which are common to duodenal ulcer, namely, cicatricial contraction in healing, perforation, hemorrhage and malignant changes, do not concern us here, except in so far as the possibility of their occurrence may influence the surgeon in his choice as to the time and type of operation to be performed. When they do occur, the surgeon is faced with some of the gravest abdominal emergencies that he is called upon to meet. Then, the problem is no longer one of dealing with ulcer, but of the best method of controlling hemorrhage or closing a perforation. We will, therefore, dismiss the first three, with the simple statement that a knowledge of their possible development in the course of the life history of an ulcer would naturally influence the surgeon in favor of early operation, since preventive measures against catastrophes such as these are always far more effective than the remedies applied after they have occurred. The fact, too, that one or more of these grave emergencies may develop, in a considerable percentage of cases of both gastric and duodenal ulcer, weighs all the more heavily in favor of early operation, and in the case of the former, of a more radical one.

Perhaps a brief discussion of malignant transformation in general may help to clarify our minds with regard to the relative importance that should be attached to this possibility in deciding for or against operation. But before doing so, however, and in order to discuss this phase of the subject more intelligently, let us for a moment consider some of the more generally accepted views as to the pathogenesis of ulcer, as influencing to a greater or less extent the surgical treatment of this affection.

The origin and persistence of gastric ulcer has been the source of much speculation and experiment. Most observers agree that the action of gastric juice plays an important part in the development and chronicity of ulcer, but there have been many theories advanced as to the initial and predisposing cause. It is apparent that there is an underlying cause for the origin and persistence of gastric ulcer, aside from the contributing effect of the digestive action of gastric juice. This has been shown experimentally by the fact that when sections of mucosa have been excised, the defects heal rapidly, in the absence of this underlying factor (Mac-Callum). The action of gastric juice alone is insufficient to inaugurate ulceration in normal gastric mucosa, and is equally ineffective in preventing the rapid healing of artificially produced defects, provided the blood supply is kept intact. It is apparent from abundant experiment, that if one single factor is to be found as the basis for ulcer of the stomach, it must be closely identified with a disturbed blood supply. By analogy with chronic ulcers elsewhere in the body, this contention is borne out. Chronic ulcers elsewhere are the result of some cause acting in a fruitful soil. Even the so-called "trophic" ulcers are usually seen in regions of the body where the blood supply is relatively poor, such as the lower leg, which is a common site for chronic ulcer. Ninety-eight per cent. of ulcers of the stomach and duodenum are located in the region of the pylorus, the posterior part of the lesser curvature, the pyloric antrum and the first portion of the duodenum.* With reference to the blood supply, they are found in that part of the stomach and duodenum supplied by the right gastric artery and the gastro-duodenal artery with its supra-

* "In the year ending June 30, 1921, there were 622 cases of peptic ulcer of the stomach and duodenum, verified by operation at the Mayo Clinic. Of this number, 500, or 80.3 per cent., were duodenal, and 122, or 19.7 per cent., gastric." (W. J. Mayo, *Progress in the Handling of Chronic Peptic Ulcer*,—*Journal A. M. A.*, Chicago, 1922, LXXIX, 19.)

"Ulcers of the lesser curvature, including those closely associated with the lesser curvature on the anterior or posterior wall comprise almost 90 per cent. of all gastric ulcers." (D. C. Balfour,—*Surgical Management of Gastric Ulcer*,—*Annals of Surgery*, 1921, LXXIV, 449.)

Of their 122 gastric ulcers, 110, or 90 per cent., were located in a fairly limited portion of the stomach, a portion roughly defined by the area supplied by the right gastric artery. These, combined with 500 duodenal ulcers, make a total of 610, or 98 per cent., of 622 cases of peptic ulcer.

duodenal branch (Wilkie). There would seem to be some relationship between these two facts. Pursuing the analogy further, one finds a marked relative absence of chronic ulcers of both the stomach and the legs of animals.*

Two marked differences are evident in this comparison of man and the four-footed animals. One is the upright position of man, which may be largely responsible for at least one distinctly human abnormality,—inguinal hernia.†

Another difference is the fact that in man the duodenum is retroperitoneal and largely immobile.

It is quite possible that a vascular arrangement which is sufficient to withstand the effects of various predisposing factors in animals is insufficient to provide a constantly wide margin of safety against similar factors in man.

Dr. W. J. Mayo attributes the preponderance of duodenal ulcers in males over females, partly to an anatomic reason, namely, the fact that the alkaline bile and pancreatic secretion, by reason of the more nearly transverse position in the female, bathe the upper duodenum more constantly.

If we assume that man, because of faulty adaptation of his circulatory apparatus to the upright position, is peculiarly liable to chronic ulcerations in certain parts of the body (the legs and the vicinity of the pylorus) we may possibly be less interested in

* Turek found no gastric ulcers in 189 healthy and 82 diseased dogs. (Journal A. M. A., 1906, XLVI, 1753.)

Mann found none in 200 normal dogs and cats. (Journal Experimental Medicine, 1916, XXIII, 203.)

Ivy found only one acute gastric ulcer in 900 dogs after etherization for laboratory experiment. He noted the great rarity of ulcer in dogs and cats and adds that if gastric juice digestion was a basic factor, we would expect to find more ulcers in dogs than in man, since the dog's acidity is of greater average acidity than man's. He suggests that there may be some factor present in man and absent in the dog which determines the chronicity of the ulcer. (Arch. Int. Med., 1920, XXV, 6.)

† While it is true that inguinal hernia is not unknown in the dog, it has been observed rarely in the boar, the stallion and other male domestic animals. It is remarkable that it does not occur more often, since both the tunica vaginalis and the canal of nuck in this animal remain patent. Hernia in dogs is more common in the female, a fact which Beall attributes to the occurrence of pregnancy. (Beall,—Maryland Medical Journal, 1905, XLVIII, 327, J. H. H. Medical Society.)

the many theories advanced for the initial cause of gastric and duodenal ulcer. There are doubtless many causes of the initial lesion which ultimately develops into a chronic ulcer. If the narrow margin of safety in the human be once encroached upon by some injury to the mucosa, the digestion and erosion by the gastric juice are probably sufficient to develop the chronic ulcer. This conception brings post-operative gastro-jejunal ulcers more closely into relationship with peptic ulcer.

With proper technique, segments of intestine may be resected, opened and implanted into the stomach wall. Provided the blood supply remains intact, the intestinal mucosa survives without ulceration. This indicates that intact living mucosa, other than gastric, resists perfectly the action of digestive juice, and suggests that gastro-jejunal ulcerations are the result of improper technique which endangers the blood supply. By "improper technique" is meant, among other things, the rough handling of tissues, the abuse of clamps in lateral anastomosis, the faulty control of bleeding producing hematoma of the suture line and the development of kinks and adhesions sufficient to impair the circulation of a localized area of intestinal wall.

The theories which have been advanced regarding the initial cause of peptic ulcer may be classified according to whether or not the initial lesion is regarded as inflammatory, neurogenic, circulatory, bacterial or digestive. The principles embodied in these theories have been claimed to act either independently or in combination in producing the acute ulcer and determining its chronicity.

Inflammatory Theory.—This was one of the earliest theories advanced and was advocated by Abercrombie and also by Cruveilhier, who was influenced by the evidence of inflammation elsewhere in the stomach. Various degrees of gastritis are frequently found in conjunction with chronic ulcer, but there is no basis for assuming that it may be a cause rather than a secondary result of the presence of the ulcer.

Neurogenic Theory.—This theory has had several interpretations based upon the effect produced on the different structures and functions of the stomach. A disturbance of the nerve supply of the stomach has been claimed to account for hypersecretion of gastric juice, hypermotility (spasm) of the musculature,

blood-vessel spasm and "trophic states," all of which have been associated by different authors with the condition of chronic ulceration.

The stomach is innervated both by the vagus nerve and by sympathetic fibers from the coeliac plexus. These nerves approach the stomach through the gastro-hepatic omentum, and after penetrating the muscular coats form the myenteric ganglia. Nicolaysen found these ganglia more profuse in the region of the cardia and near the pylorus. In extensive studies of the nerves adjacent to ulcer of the lesser curvature, both Permians and Nicolaysen found a definite and sometimes marked neuritis and perineuritis, and although they believed this condition to be secondary to the ulcer, they agreed in its probable effect on healing and on gastric motility.

As early as 1828, Cammerer had attempted to produce destruction of the stomach wall by resection of the vagus and the administration of acetic acid. There have been countless reports of experiments involving either the vagus or splanchnic nerves, many of which are contradictory. Ijzeren, in 1901, showed that after section of the vagus, ulcer was not obtained as usual, if a gastro-enterostomy was performed at the same time. Other authors, however, have not consistently observed ulcers following section of the vagus, so these results were not definite, and until Payr's work (he succeeded in producing chronic ulcers) were inseparable from normal healing. Dalla Vedova found ulcers in 41 per cent. of attempts after experimental destruction of the coeliac ganglion, and in 60 per cent. after destruction of the splanchnic nerve. Kobayashi and Kanamura observed multiple erosions of the gastric mucosa not only after pricking or extirpating the coeliac ganglion, but also after section of the spinal cord or ligation of the vagus nerve.

Rost states that if it can be shown that there is not only a definite constitutional weakness in individuals with ulcers, but an actual predisposition of the vessels in the neighborhood of the stomach to cramp, a factor of importance will have been discovered. Unfortunately, the information derived from many conflicting results of work along these lines has been of little value in its application to the treatment of the condition.

Circulatory Theory.—As a cause of simple ulcer, local circulatory disturbances with arrest or impairment of the circulation in a circumscribed part of the stomach wall have been supported by the work of many experimenters. The scope of most experiments has extended from attempts to interfere with a localized area of the mucosa, to efforts directed toward the disturbance of the circulation of the entire stomach, both directly and indirectly. Rokitsansky was the first to note hemorrhagic necrosis of gastric mucosa, and his observation was followed by Virchow's description of digestion following hemorrhagic infiltration induced by local impairment of circulation. Conditions which may effect the circulation of any part of the stomach wall include embolism and thrombosis, diseases of the vessel wall, such as atheroma, endarteritis obliterans, fatty degeneration, amyloid degeneration, miliary aneurysms and varicose dilatations, compression and obstruction by spasm of the muscular coats of the stomach wall and vaso-constriction of neurogenic origin.

In favor of the circulatory origin of chronic ulcer is the fact that parts of the stomach wall from which the circulation has been shut off are subject to digestion. This is confirmed by the production of ulcers experimentally, after injecting into the gastric arteries substances acting as emboli. Also, hemorrhagic infarctions, the hemorrhagic infiltration of acute ulcers, and their frequent funnel-like shape suggests their circulatory origin.

On the other hand, the infrequency of demonstrable changes in the blood vessels about an ulcer, the fact that ulcer occurs earlier than the age when arterial disease is usually present and the absence of ulcer in most cases of heart and arterial disease may be considered evidence against the circulatory theory.

These objections have been met by the contention that the disturbance of the circulation is an intermittent affair, the anatomic demonstration of which is impossible. The circulatory theory is here closely associated with the neurogenic theory in its explanation of the local anemia. As stated above, Klebs supports the idea of local spasmodic contraction of gastric arteries, with temporary interruption of circulation. Orth suggested that compression of the gastric vessels by spasm of the muscular coats of the stomach, occurring in vomiting and gastralgie attacks, results in hemorrhagic infiltrations which may develop into ulcers.

Attempts made to interfere directly with the circulation in parts of the stomach wall include procedures on the larger vessels and on the capillary distribution. Littauer's observations have been confirmed by Ivy, who ligated six to eight branches of the gastro-epiploic vessels supplying the pyloric portion of the stomach, with negative results. Braun demonstrated that four-fifths of the blood supply of the stomach may be cut off without necrosis. Fibich was able to produce chronic ulcers by ligating arteries, excising a portion of mucosa and cauterization of the base. This procedure, however, in the hands of Clairmont did not produce ulcers. An indirect result of these experiments has been the proof that as far as surgical procedures are concerned, the stomach is a very viable organ.

Cohnheim produced ulcers by injecting lead chromate into the gastric artery, and Payr obtained chronic ulcers by injections of formalin, dermatol and India ink. This method of injecting aseptic emboli had been used by Klebs and Welti, and recently by Ivy. Ivy obtained negative results with a bland substance, such as charcoal, and it would seem that Cohnheim's and Payr's work was not illustrative of the effects of purely aseptic emboli, but brought into consideration the actual destruction of tissue. Ulcers may be produced in this manner, which is properly a variety of trauma analogous to Roth's method of injecting silver nitrate solution into the mucosa, or even related to Daettwyler's ulcers produced by mechanical, chemical or thermal irritants applied through a gastric fistula.

The idea that the origin of gastric ulcer depends on diseased conditions of blood vessels is supported by the findings of a comparatively small group of cases. Changes in the blood vessels of the stomach have been seen in a considerable number of cases of gastric ulcer (according to Nicolaysen, 75 per cent.) and gastric ulcer has been recorded in association with most of the diseases to which blood vessels are subject. Examples of embolism of the artery supplying the ulcerated area of the stomach have been reported, but many are open to criticism.

Thrombosis of the vessels about an ulcer has been observed, and in some cases the thrombosis has been prolonged considerable distances beyond the ulcer. Atheromatous changes are not infrequently seen. Obliterating endarteritis, already mentioned,

is probably secondary, similar to that found near tuberculous cavities in the lung. Miliary aneurysms occurring independently or associated with ulcer have been described. In the majority of cases, however, no changes are found in the blood vessels of the stomach except those apparently secondary to the ulcer.

Ever since Virchow attached particular importance to disturbances in the circulation of the stomach in the pathogenesis of ulcer, especial interest has attached to the relationship between gastric ulcer and diseases of the heart and blood vessels. As might be expected, ulcers are found in a small percentage of cases in which blood-vessel changes regularly occur, including atheroma, syphilis, and nephritis. But there are many not so associated, and it will be recalled that the age of onset of gastric ulcer in nearly 70 per cent. of cases is under forty years.

Wilkie demonstrated that the blood vessels of the first part of the duodenum differ greatly from those of the remainder. The superior portion is dependent on a variable branch of the gastroduodenal artery, which he designated the supraduodenal artery. He also called attention to the scant anastomoses of the terminal portion of the vessels in this region. Berlet recently published his results with injections somewhat similar to Wilkie's. He found the profuse anastomoses of the greater portion of the stomach greatly diminished at the pylorus, and that the actual size of these vessels was small. He concluded that this condition predisposed to circulatory disturbances and was less able to establish compensatory anastomoses in the event of disturbances. This anatomical demonstration of a relatively poor blood supply of this important region of the stomach and duodenum is quite in accord with the idea that the upright position of man always plays considerable part in the pathogenesis of ulcer. Krempelhuber states that anaemia of the mucosa can be brought about purely mechanically by the gastropptosis, which according to him is present in 88 per cent. of cases of ulcer.

Bacterial Theory.—Böttcher early advocated the theory that stomach ulcers were of infectious origin. The rôle of bacteria has been considered twofold, embolic and toxic. The embolic theory leads again to the idea of local circulatory disturbance, while the toxic assumes a specificity against gastric mucosa comparable to the gastro-toxin of Bolton. Many bacteria have been

described as the causal agents of ulcer, but for the most part they have been considered secondary. Intravenous injections of different bacteria have yielded no constant results. Bolton was convinced that the commonest cause of necrosis of the mucous membrane, resulting in acute ulcer, is bacterial infection through the blood stream and that the necrosis was due to direct effect on the tissues of bacterial poison alone or combined with the action of gastric juice.

A most significant and interesting work has been that of Rosenow, of the Mayo Clinic, who has shown the selective affinity of streptococci, which are capable of reproducing lesions peculiar to the particular strain. Rosenow's summary of his work in 1916 was as follows: "The ulcers produced by the injection of streptococci resemble those of man in location, gross and microscopic appearance, and in that they tend to become chronic, perforate or cause a severe or fatal hemorrhage. Streptococci having a characteristic affinity for the stomach and duodenum have been repeatedly isolated from various foci of infection in patients with ulcer and from ulcers themselves. They tend to disappear from the circulation and do not commonly produce marked lesions otherwise. They have been isolated from ulcers in animals, and ulcer has again been produced on their re-injection. Filtrates of these cultures have no special tendency to produce ulcer." He states in conclusion: "The small ulcer of the stomach and of the duodenum in man is primarily due to a localized haematogenous infection of the mucous membranes by streptococci." Rosenow's conclusions have not been unreservedly accepted by bacteriologists. Although streptococci are present in practically all gastric ulcers, doubt has been expressed that these organisms have been proven to be the factor which either initiates the ulcer or prevents healing. In spite of this, most surgeons have made practical application of the principle that the treatment of gastric ulcer should be reinforced by a thorough search for and elimination of all possible foci of infection elsewhere in the body, appendix, gall bladder, teeth, tonsils, etc.

Digestive or Corrosive Theory.—The importance of the gastric juice in the production and development of ulcers has long held the attention of surgeons. It is now generally thought that gastric juice has little or no part in the initiation of ulceration, but

that its digestive action, after injury to the mucosa, is an important contribution toward the chronicity of the ulcer. It is even probable that these two factors—initial injury and subsequent digestion—if unaccompanied by a continuance of the underlying cause, are insufficient to prevent healing. Without previous injury, the gastric mucosa resists digestion. With ordinary injuries, gastric digestion alone is insufficient to prevent healing. Many attempts have been made to explain this resistance of gastric epithelium. Hunter believed that resistance to digestion is a general property of all living uninjured cells. This would seem to be disproved by the common occurrence of digestion of the skin about a gastrostomy opening. Also, Claude Bernard noted digestion of the thigh of a living frog which was placed in a gastric fistula; and Pavy observed the same effect on a rabbit's ear. Matthes' explanation that the living tissue was killed by hydrochloric acid before digestion took place does not solve the difficulty. Epithelium other than gastric is able to resist this action of hydrochloric acid, which may be properly included in the digestive process. Hanrahan has recently implanted into the stomachs of dogs, resected and opened loops of small intestine, preserving carefully their viability, and has noted superficial erosions in only a small number. The problem apparently deals not with living uninjured tissue as such, but with the explanation of the protective power of alimentary mucosa against gastric digestion. This resistance has been attributed to the presence of mucin in the mucous secretion of the pyloric antrum and to the presence of a so-called antipepsin. The theory, therefore, that the resistance of gastric mucosa against autodigestion is due to the presence of antipepsin and that a diminution of this substance in the stomach wall is followed by ulcer, has not as yet been proven.

The multiplicity of methods by which acute ulcers may be experimentally produced has probably cleared rather than obscured the problem of pathogenesis. Ivy, whose important work has touched on most aspects of the physiology of the stomach, concluded that acute ulcers may be produced by anything that causes a local necrosis by direct, toxic, or chemical action on mucosal cells, or by interfering with or disturbing the normal condition of the capillaries of the mucosa. He classified the chief theories as regards the pathogenesis of ulcers as follows:

1. Infection of the mucous membrane through the blood by specific or non-specific bacteria from a focal infection, is the primary factor and source of re-infection;

2. The corrosive action of gastric juice on mucosal cells that in some way have had their normal resistance against acid-pepsin digestion diminished, prevents healing;

3. Localized trophic disturbance is responsible for chronicity of the ulcer;

4. A general condition of autolysis plays the important rôle.

The peculiarity of stomach ulcers is probably due not to any specific cause, but to the digestive action of the gastric juice, which keeps clean the base and sides of the ulcer. The clean edges and base incident to all ulcers of the stomach justify no conclusion as to the cause of the ulcer. Peptic ulcers probably originate from various causes acting upon favorable tissue—that part of the stomach and duodenum supplied by the right gastric artery and the gastro-duodenal artery, with its supra-duodenal branch. The initial injury is rendered chronic by the continuous erosive action of the gastric juice, which is aided in its effect by adjacent (secondary) neuritis, perineuritis, and obliterating endarteritis. In other words chronic ulcer of the stomach and duodenum is due in all probability not to a single cause acting alone, but to a combination of causes acting more or less together.

Malignant Transformation.—First suggested by Cruveilhier in 1829, the tendency of gastric ulcers to become cancerous has been commented on repeatedly by pathologists and surgeons since that time. That ulcer of the stomach may be the origin of carcinoma seems definitely established. It is of considerable importance to the surgeon, inasmuch as his treatment of gastric ulcer must be profoundly influenced by his opinion of the proportion of simple ulcers in which this carcinomatous change may be expected to develop. The surgeon who believes that this proportion is over 50 per cent. will obviously advocate more radical procedures than the surgeon who believes it to be less than 5 per cent.

Cabot and Adie have recently reviewed the trend of opinion on this subject and have shown the fluctuations of surgical opinion on the estimated percentage. From their article it is found that of 82 reports, 74 authors believed that less than 10 per cent. of gastric ulcers develop carcinoma; while 15 authors believe the

frequency to be over 50 per cent. This wide variation indicates that while the tendency is recognized, the criteria on which opinions are based differ greatly. It is of vital importance that these criteria be so established that published reports will have some common basis for comparison. The solution of the problem has been approached by three methods of study:

1. The comparison of the occurrence of ulcers and carcinoma by the statistical method;

2. The study of the history of cases of ulcer and carcinoma with the attempt to differentiate one from the other at some stage. Likewise the study of the life history of ulcer, treated conservatively;

3. The study of the gross and microscopic pathology.

Little of the information gained from any one of these methods may be considered as of positive value. The material may unconsciously be used to support a preconceived idea, which would detract immeasurably from a conclusion which is at best inferential. However, if it is found that the frequency of occurrence as estimated from all of these methods regularly falls near a common figure, we have valuable evidence which would enable us to discount any unusual figures which would be arrived at by the use of only one method of study.

Williams has made extensive use of statistical evidence and regarded it as incompatible with the frequent origin of cancer from ulcer. His conclusions were based on the sex and age incidence and the comparison of the location of ulcer and carcinoma.

Clinical evidence has been furnished by many observers, and there are definite examples reported in which carcinoma has been preceded by a long history of ulcer. A very sound objection to inferences drawn from this is the difficulty not uncommonly encountered of differentiating clinically, gastric from duodenal ulcer. Several authors claim that the transition from simple ulcer to carcinoma is marked by the change from hyperacidity to anacidity, the appearance of a tumor, and cachexia in the course of long observed cases. Lockwood, in 174 cases of gastric carcinoma, found a suggestive history of ulcer in 7 per cent., and definite in 3 per cent. Less than 5 per cent. of carcinomas developed in 346 ulcers of the stomach treated by medical measures and observed by Greenough and Joslin, and by Hemmeter. Jos-

lin later published figures showing that 24 per cent. of the late deaths following operation for gastric and duodenal ulcers were from cancer of the stomach. From studies of the literature Galpern found a small percentage of recurrences in the form of carcinoma, and Gressot places the frequency at 23 per cent. Balfour reports that in 799 cases operated on for gastric ulcer at the Mayo Clinic, 33 or 4.1 per cent. died of cancer during a seven-year period. In 1,610 cases cited by Ewing, the frequency was 2.2 per cent., and this author believes it quite possible that some of these were originally cancer. Ewing states that from clinical evidence it may be concluded that a great number of ulcers have been treated medically for some years without developing cancer; that the number developing cancer after gastro-enterostomy is not appreciably larger than after resection of the ulcer; that a diagnosis of cancer following ulcer, to be acceptable, should carry with it a previous history of ulcer; that this history covers a period of ten to thirty years in certain well attested cases, while in less satisfactory but possibly genuine cases the history of ulcer covers only two years.

The microscopic examination probably accounts for the greatest variation of opinion as to frequency. When the ulcerated primary carcinomas are eliminated, there is left a group of chronic ulcers in whose edges are changes that have been interpreted by some as inflammatory hyperplasia, by others as carcinoma. Wilson and MacCarty are perhaps the chief modern exponents of the latter contention. On the basis of their studies and their interpretation of cellular pathology they have estimated the proportion of ulcers which develop secondary carcinoma as 68 per cent.; and also, the proportion of carcinomata which develop from pre-existing ulcer as 71 per cent. Ewing feels that these inflammatory hyperplasias and misplacements may well be considered as precancerous lesions, but that on the other hand, there is no direct evidence to show that any given precancerous lesion would if undisturbed go on to develop cancer. Indeed, Galpern and Bamberger's observations on the fate of gastric ulcer after gastro-enterostomy seem to prove that these lesions seldom do go on to produce cancer.

While we believe that carcinomatous transformation does not occur in more than 10 or at the most 15 per cent. of gastric ulcers,

there is another more practical phase of the question that is not answered by the academic discussion. The operating surgeon should be able to classify the lesions which Ewing says readily fall into two groups, simple ulcers and primary ulcerated carcinoma. If he is unable to differentiate these, and in addition believes that over 50 per cent. of the former develop secondary carcinoma, he will be consistently radical in his procedures. On the other hand, the surgeon who recognizes and differentiates between simple ulcer and ulcerated carcinoma either from the gross appearance described above, or with the aid of a microscopic pathologist with whose criteria he is in accord, and who does not consider local migratory hyperplasia indicative of cancer, will have little hesitancy in treating simple ulcers conservatively.

The problem may present itself according to what proportion of ulcerated lesions the surgeon is able to identify at the operating table. It is our impression that about 85 per cent. of such cases may be recognized without microscopic aid; that about 10 per cent. more will be identified by means of frozen sections, and that in about 5 per cent. both the surgeon and the pathologist will be uncertain as to their true nature. We do not feel that 70 per cent. of chronic ulcerated lesions unaccompanied by tumor or metastases, are carcinomatous. We feel that about 85 per cent. of simple ulcers are recognizable as such on the basis of chronicity, the character of the edges and base, and the absence of tumor or metastases. Of the remaining 15 per cent., on microscopic examination about 5 per cent. will be found entirely benign; another 5 per cent. will present recognizable carcinoma; while the remainder will require microscopic study of serial sections to ascertain their true character.

Surgical Treatment.—The operations usually performed for ulcer of the stomach may be considered as being either conservative or radical. The conservative group may be subdivided into the following procedures: (1) procedures directed toward local excision, cauterization or suture of the ulcer; (2) local excision, etc., plus gastro-enterostomy or pyloroplasty; and (3) gastro-enterostomy or pyloroplasty alone. An operation may be considered radical when the effort is made to remove not only the ulcer, but also that part of the stomach which develops 90 per cent. of ulcers (the so-called ulcer-bearing area of Rodman).

Following this partial gastrectomy, continuity is restored by means of some modification of the principle involved in either the Billroth I or Billroth II anastomoses.

In his choice of operation the surgeon should be wholly influenced by the condition of his patient. The general condition may be greatly affected by such complications as hemorrhage or perforation, with resultant shock, which would restrict the extent of surgical intervention. Such local conditions as dense adhesions or peritonitis might limit the extent of operative procedures. The surgeon, therefore, should be guided directly by the conditions found in the individual case. If a chronic ulcer is operated upon in a quiescent stage, the limitation imposed by the patient's general condition may not be in force. The operative procedure selected will then be determined by the surgeon's opinion regarding the following important considerations: (1) the importance of removal of the ulcer-bearing area of the stomach; (2) the efficacy of the reduction of gastric acidity by a large resection; and (3) the possibility of subsequent carcinomatous transformation.

Pre-Operative Preparation.—Previous to all surgical operations upon the stomach, there should always be a period of preliminary preparation, unless, of course, the operation is in the nature of an emergency. It has been our invariable practice for many years to prepare our patients according to a regular routine. In patients so prepared infection has been reduced to a negligible quantity. We prepare our patients as follows:

For several days previous to the operation the patient is instructed to brush his teeth thoroughly with an antiseptic tooth-paste and rinse the mouth with a one per cent. carbolic acid solution several times a day. For the same length of time he is kept on a sterile diet, *i.e.*, cooked foods, pasteurized or boiled milk, eggs, orange juice, boiled water, etc. If there is gastric stasis present, lavage once or twice a day, depending upon conditions present, should be employed. Repeated observations by various authors, notably Cushing and Livingood, observations which have been abundantly confirmed by us in cultures taken from both stomach and duodenum upon the operating table, have convinced us that the acid stomach will sterilize itself in approximately forty-eight hours, if no infectious material is meanwhile ingested.

However, this rule does not apply in case of ulcerating carcinoma of the stomach walls. In the latter condition we have recovered various forms of bacteria, especially the streptococcus pyogenes.

The routine comprehensive physical examination of the patient demanded by good surgery should never be omitted, except in case of dire emergency. Starved, dehydrated and exsanguinated patients should be given benefit of the therapeutic measures indicated in the individual case. Fluids should be forced on the patient, and if the gastric condition limits the amount which can be given by mouth, we rely on hypodermoclysis and proctoclysis. Transfusions are given when the percentage of haemoglobin is under sixty.

In the choice of anaesthetic, due consideration should be given to the claims of local as against general methods. More and more is it becoming evident that when properly used, regional nerve block combined with either anterior or posterior splanchnic block yields excellent results. The administration of a general anaesthetic should always be in the hands of the most competent anaesthetist available. The fundamental rules of good surgery, meticulous attention to details, complete asepsis, gentle handling of tissues, absolute haemostasis, and the avoidance of undue haste, should invariably govern the surgeon's every action. When scrupulously observed, they to a marked degree, favorably influence the ultimate result.

Perforation.—This complication occurs in about 28.1 per cent. of gastric ulcers, and is responsible for about 7 per cent. of the deaths from this condition as found at autopsy. Of all the catastrophes that require the help of the surgeon few are more urgently insistent in their demands upon his resources than is a perforated gastric ulcer. Not only is the life of the patient seriously jeopardized by the rapidly ensuing peritonitis, but the frequently accompanying shock and agonizing pain demand the earliest possible relief. It is of the utmost importance then, that an early provisional diagnosis be made in order that valuable time may not be lost. The most characteristic feature of acute perforation of a gastric ulcer is a sudden unheralded pain in the epigastrium. This pain is described in various terms by different patients, but all agree upon one point, namely, its extreme severity. The patient lies in one position not daring to move; his body is

tense and rigid; he will not tolerate any manipulation by the examining surgeon, so sensitive is the abdomen, especially over the region of the perforation. The patient usually presents the classical appearance of profound shock, with the single and marked exception that there is little corresponding change in the pulse. Its character and rate are, at first, surprisingly little affected by the perforation, but rapidly change as soon as the resulting peritoneal inflammation becomes well established. But this should never be allowed to occur, unless the patient is out of reach of competent medical help at the time of perforation. Quickness of action is the essence of good management in an emergency of this character. In the presence of the clinical picture just described, neither the doctor nor the surgeon can be held blameless who will allow a moment's unnecessary delay, even to make a positive diagnosis, before opening the abdomen. The real question to be decided is not so much "What has happened?" but rather "Has something sufficiently grave transpired within the abdomen as to seriously threaten, in its consequences, the life of the patient?" If so, it is far safer to open the abdomen immediately, while the patient is still in good condition, rather than run the risk of peritonitis, or hemorrhage, or strangulation, or what not, and so lose the golden opportunity, while waiting to make a finished diagnosis. If err we must, as sometimes we may, let us be sure to err on the safe side. In other words, when in doubt, operate. This is often the more conservative course.

Moynihan's classification of perforation of the stomach into acute, subacute, and chronic types is excellent. All of them are essentially surgical and should be so dealt with, appropriate measures being applied to the individual case. If the ulcer happens to be situated on the anterior wall near the pylorus, as occasionally happens, the operation of choice is a pyloroplasty so modified as to include the ulcer together with its perforation, between the anterior and posterior suture lines, thereby excising the whole area. I have frequently done this in the case of perforating duodenal ulcer and a few times in perforating gastric ulcer situated close to the pylorus, without materially disturbing the regular technique of the pyloroplasty. However, when the perforation occurs along the lesser curvature, as is more often the case, the choice of operation lies between:

1. Suture of the perforation;
2. Suture of the perforation together with posterior gastro-enterostomy;
3. Partial gastrectomy followed by one of the usual methods of gastro-intestinal anastomosis.

Some authorities, Deaver for instance, insist upon closure of the perforation followed by gastro-enterostomy as a routine procedure; while others, headed by Moynihan, practice it only when the exigencies of the case, such as pyloric obstruction or multiple ulcers demand it. The latter course has been our own custom, as it has always seemed advisable to limit the length of time of operation to the minimum, owing to the condition of the patient; and furthermore, the cases in which gastro-enterostomy was not done have seemed to do as well as, or even better than, those in which it was practised.

Certain difficulties will be encountered in the course of the operation. In the first place, the patient will be suffering from more or less shock and collapse as a result of the perforation. Every precaution should be taken to combat this condition with the recognized means at the surgeon's disposal. After the abdomen has been opened, it may not always be easy to find the perforation, even through an incision of ample length which should always be made. The high right rectus incision is the incision of choice. Aids to the location of the ulcer will be the presence of thick masses of fibrinous exudate, or escaping fluids through the perforation in the stomach or duodenal wall. If the perforation does not readily present itself, search should be made in the region where it usually occurs, namely, in the neighborhood of the pylorus along the lesser curvature. As soon as it has been found, that part of the stomach should be gently drawn up into the wound, and isolated from the rest of the abdominal cavity by gauze pads wet with warm salt solution. The perforation and surrounding area are then carefully inspected while the surgeon is determining his subsequent course of action. It should be emphasized that here as elsewhere, every case is a law unto itself. The surgeon's problem is to apply to this particular case that particular form of operative procedure which in his judgment is most suitable to the conditions present. It is bad practice and worse surgery to attempt to adapt any one course

of treatment, no matter how good it may be, to every case. One but courts disaster in pushing any operative procedure beyond its natural limitations. All that will usually be found necessary, after having found the ulcer and cleaned off the deposit of fibrin, is to infold the edges and keep them approximated as best one can by that form of suture most easily adaptable to the conditions found. Personally, where the edges of the ulcer and adjacent walls of the intestine are found to be rigid and indurated owing to oedema and round cell infiltration, the interrupted mattress suture of Halsted has been found most satisfactory, as it includes a better bite of tissue than other types and secures better inversion. The continuous suture, which is easier and quicker than any other, may be reserved for less trying conditions.

It is always well to reinforce the suture line with omentum or with other adjacent and available tissues. Before closing the abdomen, we have made a practice of turning the omentum upward under the liver and between the stomach and the anterior abdominal wall, relying on it to reinforce the suture line still further, and to limit the area of possible infection. The question of drainage is a debatable one. Some authorities advise drainage as a routine practice; others, led by Yates, oppose it. As a general rule, our own inclination is to follow the latter course. Therefore, we seldom drain. There are occasional exceptions, however, particularly in those cases operated upon late, after a peritonitis has become pretty well generalized. It is a good rule to drain thoroughly if one drains at all. This means multiple drains placed in dependent portions as indicated, and brought out through stab wounds in the flanks and above the pubes, or in the case of women, through the vagina. We prefer cigarette drains, two at each point, as two drains act better than one. Others prefer rubber drainage tubes. Early removal of drains is to be encouraged.

Differences of opinion are to be found among surgeons of experience with reference to the toilet of the peritoneum. Authority can be found for almost any method that one may employ. In general it may be said, however, that the same rules with regard to the gentle handling of tissues apply with equal force to the inflamed peritoneum as elsewhere. It is a serious question whether or not more harm than good may be done by attempting

more than the removal of gross particles of food and other material readily accessible. The thing to be feared is the subsequent development of abscess formation arising from the pocketing of pus in various localities. Especially is one to be on one's guard against subphrenic abscess, always a very serious post-operative complication, which should be recognized early, in order that it may be promptly dealt with.

If for any reason it is decided to perform a gastro-enterostomy after having closed the perforation, the same principles should govern as in uncomplicated cases. If on the other hand, owing to the suspicious appearance of the ulcer, or the inability of the surgeon satisfactorily to handle otherwise the problem presented, a partial gastrectomy appears indicated, it differs in no way from the usual method of performance.

We have thus far been dealing with the management of acute perforations. The same principles apply in the case of subacute perforation, the only difference being that, owing to the more minute character of the perforation, there is greater likelihood of finding the infected area walled off by protective adhesions, and a correspondingly decreased extravasation of stomach contents. The problem of the surgeon is therefore simplified to the extent that he is dealing with a localized rather than a generalized process. In the case of the chronic perforation the problem usually resolves itself into the treatment of a perigastric abscess. The methods employed should vary according to the location of the abscess and the other structures involved, *e.g.*, subphrenic abscess, the pancreas, liver, etc.

The post-operative care of these patients is of the utmost importance. It consists in proper posture, the maintenance of the Fowler position, forced fluids by every avenue except the mouth for the first few days; the Murphy drip, subcutaneous and intravenous infusion of normal salt solution, and in extreme cases, blood transfusion. After the first day or two water, crushed ice, and other fluids may be cautiously administered by mouth in gradually increasing quantities. Morphia in sufficient quantity to keep the patient quiet and reasonably comfortable is always indicated. Withholding it, except in case of individual idiosyncrasy is to be condemned.

Classification of Surgical Treatment.—The surgical treatment of chronic (non-perforated) peptic ulcer may properly be considered under three main heads:

1. Excision.
 - a. Simple excision of the ulcer.
 - b. Excision combined with pyloroplasty.
 - c. Excision combined with gastro-enterostomy.
2. Gastro-enterostomy.
 - a. Gastro-enterostomy alone.
 - b. Combined with excision.
 - c. Combined with jejunostomy.
3. Resection of a portion of the stomach.
 - a. Resection of body (sleeve or wedge).
 - b. Partial gastrectomy.
 - c. Total gastrectomy.

This classification is obviously quite arbitrary, but it forms a good working basis and is readily understood.

The Operations for Chronic Ulcer.—About 90 per cent. of gastric ulcers occur at or near the pylorus or along the lesser curvature, and the danger of stenosis attending simple excision in this location contra-indicates this procedure. Depending on the position and size of the lesion, the operations of choice for the majority of chronic gastric ulcers include pyloroplasty or gastro-enterostomy with excision of the ulcer, and partial gastrectomy followed by gastro-duodenostomy or gastro-jejunostomy. It is obvious that simple excision of ulcers which are located on the anterior or posterior wall of the body of the stomach is probably rarely performed. In addition to the anatomical difficulties presented, the surgeon is doubtless influenced by his desire to perform a more corrective operation.

When the ulcer is located at the pylorus, or in the pyloric portion of the anterior wall, a pyloroplasty presents the advantages of excision of the ulcer, with a reconstruction of the pyloric orifice in such a way that the possibility of stenosis is entirely eliminated. For those to whom this procedure appeals, the Finney pyloroplasty, the Heineke-Mikulicz operation and its modifications, as practised by C. H. Mayo and J. S. Horsley, offer many possibilities. If a pyloroplastic operation is not used, the opera-

tor will probably perform either a gastro-enterostomy with or without excision of the ulcer, or the more radical procedure, partial gastrectomy with restoration by one of the modifications of the Billroth I or II.

If a local excision of a pyloric ulcer is performed, the ensuing closure may obliterate the pyloric orifice, and unless combined with pyloroplasty, as mentioned above, gastro-enterostomy must be performed. Gastro-enterostomy with an obstructed pylorus will, as a rule, give better clinical results than one performed in the presence of a patent pylorus. If the ulcer is not excised, good results may be obtained from gastro-enterostomy, and healing of the ulcer probably takes place in most cases. We do not agree with the high figures quoted by some for carcinomatous transformation. If possible, however, the ulcer should be excised because there is always the possibility that the lesion may be primarily a cancer, or that cancer may later develop.

The radical partial gastrectomy for pyloric ulcer has many advocates. The arguments in favor of this procedure are that it removes the ulcer-bearing area of the stomach (Rodman), and that gastric secretion is diminished by the removal of a large portion of normal gastric mucosa. Advocates of this wide resection feel that the incidence of postoperative gastro-intestinal ulcers is thereby greatly lowered, and also that in capable hands the operative mortality does not exceed the mortality after gastro-enterostomy. When the ulcer is further removed from the pylorus other operative methods are to be employed, depending upon the location of the ulcer, its size and its relation to surrounding structures.

In dealing with ulcers situated along the lesser curvature, several courses are open. Simple gastro-enterostomy or pyloroplasty may be performed or may be combined with local excision of the ulcer, which in this location may be carried out with a wedge- or V-shaped resection. Sleeve or segmental resections have occasionally been used to advantage here. Ulcers situated high on the lesser curvature are perhaps better treated by the more radical partial gastrectomies, or if resection is not done, by gastro-enterostomy followed by jejunostomy as recommended by Moynihan.

Ulcers elsewhere than at the pylorus or on the lesser curvature may more often be treated by simple excision and closure, without the pressing necessity of pyloroplasty, or gastro-enterostomy. Sleeve resections offer some possibilities, but we feel that the cases which may be suitable for this procedure are better treated by partial gastrectomy, followed when possible by the von Haberer-Finney modification of the Billroth I restoration, or by one of the modifications of the Billroth II.

If the ulcer has become adherent to the pancreas, liver, or less rarely the spleen, it may be excised and the base simply cauterized and left in place, and the stomach restored as above. Drainage to this area is usually advisable.

Discussion of Operations for Gastric Ulcer.—In considering stomach operations as a whole, we find that they may be divided into two groups based on the type of restoration as compared with normal anatomy and physiology. On the one hand we may have the pyloroplastic operations, and gastro-duodenostomy after partial gastrectomy. In this group of operations the restoration of gastro-intestinal continuity follows the normal arrangement—stomach to duodenum without blind loops. On the other hand, there are the operations depending on the principle of short-circuiting, such as gastro-enterostomy, the Billroth II and its modifications. Following this type of operation, there are two openings from the stomach, also the gastric contents enter the jejunum, which is by nature not well adapted to withstand the effects of gastric juices. Added to this, there is the ever present danger of retrograde filling of the closed loop.

For purposes of discussion we will contrast pyloroplasty with gastro-enterostomy, and gastro-duodenostomy as opposed to the Billroth II and its modifications, as the choice of operation is usually made between these.

Pyloroplasty vs. Gastro-enterostomy.—Pyloroplasty as usually carried out eliminates the possibility of pyloric stenosis by the abolition of the pyloric ring. There remains no sphincteric action and the size of the opening from the stomach is limited only by the diameter of the duodenum. After the operation there is a reduction of gastric acidity, brought about by two factors, abolition of pyloric stenosis and the effect of bile and pancreatic juice regurgitated into the stomach. In nearly every case

the total quantity of acid as well as the percentage of free hydrochloric acid, which may be high before operation, is gradually reduced to normal. This does not occur immediately after operation but requires about two months before the normal is established, after which it remains stationary. Hughson found that this gradual reduction of gastric acidity seems to parallel a gradual reduction in the relaxing time as observed under the fluoroscope. There is apparently a two-months' interval before the maximum beneficial effect of pyloroplasty is seen, during which careful attention should be paid to the dietary régime.

Gastro-enterostomy is apparently not a drainage operation, but depends for its beneficial effect on the reduction of gastric acidity by regurgitation of alkaline duodenal contents into the stomach. The effect of gastro-enterostomy upon the physiology of digestion has received much attention. Haertel, Schneller, and Petréon showed that in the presence of a patent pylorus the peristaltic wave is unchanged after gastro-enterostomy and that food passes in equal parts through the pylorus and the stoma. Cannon and Blake have shown that unless the stoma is placed very near the pylorus, the gastric contents even when fluid are pushed through the pylorus rather than through the stoma. This work was supported by that of Guibe, Hartman, and Kelling, but disagreed with by Outland, Skinner, and Clendenning, who claimed that gastro-enterostomy is a drainage operation and prevents passage of food through the pylorus. Kelling's work, antedating Cannon's, offers material support to the latter in that after experimental gastro-enterostomy, of 250 cc. of methylene blue in water administered by mouth, 235 cc. were recovered from a duodenal fistula and only 15 cc. from a jejunal fistula. We are able to offer experimental work in support of Guibe, who found that as long as the pylorus remains patent, the stomach has a marked tendency to drive out its contents through that orifice without being inclined to utilize the artificial mouth. Hanrahan has sectioned the duodenum in dogs, in its first part just above the ampulla, and performed gastro-enterostomy on the greater curvature, immediately over the vertebral column. The stoma was four to five cm. in length, but on resumption of feeding was not utilized, with the result that the duodenal blind end in every case was ruptured. Cannon and Blake frequently observed circula-

tion of food but not the symptoms of vicious circle, which is brought about when there is a kink or other obstruction just distal to the anastomosis. The probability of a circulation of food whenever the pylorus is left open, the non-mixture of the food with the digestive and neutralizing fluids in the duodenum, and the ever present danger of kinks are some of the factors contributing to make gastro-enterostomy a not ideal operation.

In pyloroplasty these objections, according to Cannon and Blake, are avoided. Too rapid exit of food through the pylorus is prevented by rhythmic segmentation of food in the duodenum, an activity which in part replaces the function of the pylorus and also mixes food with pancreatic juice and bile.

In addition to its unphysiological aspects, gastro-enterostomy may be attended by the none too rare complication of gastro-jejunal ulceration. We have seen duodenal ulceration follow pyloroplasty in only two instances, probably a persistence of the original ulcers. One appeared after five years, another after one and a half years. In both cases the operation had been performed for duodenal ulcer which we were unable completely to excise at operation. This rarity may of course be explained by the fact that we never use clamps in performing this operation. From experimental work and from clinical observations we have come to the following conclusions regarding the causation of post-operative gastro-jejunal ulcers: (1) while the intestinal mucosa with intact circulation has the general property of resisting gastric juice digestion, there is a slightly increasing susceptibility to this digestion, the farther the anastomosis is made from the pylorus; (2) secondary ulceration occurs most frequently when gastro-enterostomy is performed in the presence of hyperacidity or, more rarely, achylia; (3) the most direct cause of secondary ulceration is faulty technique, such as the improper use of clamps and haemostatic sutures. Montgomery, in 1924, called attention to haematomata in the suture line as a cause of ulceration, and also to the unimportance of the type of suture material.

It is on the basis of a comparison of our results following pyloroplasty with those following gastro-enterostomy that for the reconstruction following partial gastrectomy we advocate the termino-lateral Billroth I type, (the Haberer-Finney method) rather than the Billroth II or its modifications.

We object to the Billroth II group of operations for the same reasons that we object to gastro-enterostomy. To be sure, the incidence of gastro-jejunal ulceration is less than after gastro-enterostomy, but it occurs. Our principal objection is that there is present by these methods the danger of partial obstruction or occasional retrograde filling of the closed loop. If the Scylla of these latter dangers be avoided by the use of entero-anastomosis between the proximal and distal loops of the jejunum, one courts disaster from the Charybdis of secondary jejunal ulceration.

These dangers may be avoided by direct union of the remaining portion of the stomach to the duodenum. This is the principle of the Billroth I. It will be remembered that the Billroth I operation was found to entail what seemed, at the time, too difficult technique, *i.e.*, the union of three lines of sutures, and it was to circumvent this danger that Koehler recommended his method of gastro-duodenostomy, and that in addition to other considerations, led Billroth to advocate his second method. This technical difficulty, however, has, we believe, been solved both by Haberer, who published his results in 1922, and by the speaker, whose report followed independently in 1923. These operators, by thorough mobilization of the duodenum, found that an end-to-side gastro-duodenostomy could be performed in nearly all cases of extensive resections. One may even use this method for a total gastric resection, uniting the cardia to the side of the duodenum. This union is a decidedly more physiological reconstruction than the Billroth II and its modifications, and is to be advised in all cases where sufficient duodenal mobilization can be accomplished to avoid suture strain.

We feel very strongly that an operator should not attempt to force the performance of any one particular type of operation in dealing with gastric or duodenal ulcer. Perforated ulcers should be closed or excised. When located at the pylorus or on the anterior wall near the pylorus, excision may be combined with pyloroplasty. If pyloroplastic operation is not done, gastro-enterostomy is recommended when the patency of the pylorus is diminished or endangered. Perforations away from the pylorus should be excised or closed, or if the condition of the patient permits more extensive surgery, we should recommend partial gastrectomy.

In dealing with chronic ulcers operated upon in a quiescent stage, we prefer pyloroplasty with excision, or partial gastrectomy followed by the Haberer-Finney modification of the Billroth I operation.

Gastro-enterostomy.—This important operation was first performed September 28th, 1881, by Anton Wölfler, an assistant in Billroth's clinic. The anastomosis was made between the stomach "a finger-breadth above the insertion of the gastro-colic ligament," and "a loop of small intestine." Credit has been given to Nicoladoni for having suggested gastro-enterostomy to Wölfler, but we have been unable to find any authority for this division of credit.

The untoward result of the second operation performed a few days later by Billroth showed the necessity for suturing the proximal loop of intestine to the stomach in such a way as to prevent kinking and consequent occlusion. In 1883 Courvoisier advocated making the anastomosis retrocolic and with either the duodeno-jejunal flexure, or the first portion of the jejunum. Von Hacker in 1885 perfected the method of making the opening in the transverse mesocolon, so that the danger to the circulation of the transverse colon is minimized. A third method was sponsored by Billroth and Brenner, by which the jejunal loop was brought through openings in both the transverse mesocolon and the gastro-colic ligament and sutured on the anterior surface of the stomach. To prevent regurgitation of duodenal contents Kocher made the incision in the stomach perpendicular to the long axis and curved so as to form a valve-like opening. The valuable adjunct of entero-anastomosis between the afferent and efferent loops of intestine was suggested by Braun and Jaboulay. The object of this procedure was to regulate the conditions of poor circulation in the loops of intestine thus sutured together in such a way that outflow of the contents of the stomach and intestine is assured. This procedure, performed after any gastro-jejunal anastomosis which entails long afferent and efferent loops, has much to recommend it.

Posterior gastro-enterostomy was improved by von Hacker in 1885, Czerny in 1890, and later brought to its present form by the Mayos, Moynihan, and others. To no other operation have there been suggested more modifications than to gastro-enteros-

tomy. These modifications have had to do with the position of application of the jejunal loop, the length, shape and position of the stoma, and the methods of suture. The introduction of the Murphy button gave a decided impetus to gastro-intestinal surgery. It has certain advantages as well as obvious disadvantages. We would not recommend its use as a routine procedure, but occasions may undoubtedly arise in which its use is indicated, although the speaker has never had occasion to use it. It is frequently used by the French (Pauchet), for entero-anastomosis, when speed is essential.

Billroth I: Haberer-Finney Modification.—In our hands this procedure has been the logical and inevitable outgrowth of the pyloroplasty operation. It represents an attempt to excise the more inaccessible ulcers in the vicinity of the pylorus, particularly those located posteriorly, and to restore continuity by a form of gastro-duodenal anastomosis which embodies the best features of the pyloroplasty. Some of our more difficult and extensive pyloroplasties with excision, particularly when the ulcer was posterior, suggested that the whole procedure would be much simplified by a pylorectomy, which could be followed by a gastro-duodenostomy, using the entire orifice of the stomach and implanting it into the side of the duodenum whose open end has been closed in the usual manner. This anastomosis is practically our pyloroplasty closure, with the exception that the upper curve of the horseshoe incision has been eliminated by the pylorectomy.

We have repeatedly emphasized our firm conviction that the future great advance in surgery of the stomach will depend largely on the utilization of the principles of mobilization of the stomach and duodenum. Pyloroplasty is to a large extent based on this mobilization, and even more so is this method of gastro-duodenostomy.

In this procedure the pyloric end of the stomach is resected in the usual fashion. The stomach is mobilized in the manner suggested by W. J. Mayo and its open end guarded with a clamp which is allowed to remain in place while the duodenum is prepared. The duodenal stump is closed by whatever method is preferred. We prefer a pursestring suture of silk re-inforced by a number of mattress sutures. Then throughout almost its entire length the duodenum is freely and thoroughly mobilized

by the procedure described above. It will be found that this mobilized duodenum may be turned medianward, and that the orifice of the remaining portion of the stomach may be sutured to the side of the duodenum in exactly the same manner in which a termino-lateral gastro-jejunal anastomosis is made. The closed end of the duodenum lies just above the lesser curvature. It should be placed far enough above the orifice of the stomach so that the inverted end presents no possibility of obstructing the orifice; but not so far that there may be a closed loop.

The duodenum and the open end of the stomach are then united by any form of suture desired. The incision in the wall of the duodenum is made to correspond in length to the diameter of the stomach. If the latter is too large, it may be made smaller by closing as much of the stomach as may be desirable, in the manner advocated by Crile. This step is much the same as the treatment of the stomach end in the typical Billroth I.

After having performed this operation several times, we were interested to find that von Haberer, in Innsbruck, had been using the same method, which he had reported in 1922. Our report was made a year later.

The operation has many advantages as contrasted with the Billroth II and its modifications. Gastric contents are received into the duodenum; there is no danger of retrograde filling of a closed duodenal loop or of a partial proximal duodenal obstruction. The transverse mesocolon is not interfered with nor is there any necessity for an ante-colic anastomosis. The chances of post-operative secondary ulceration are greatly diminished. We have encountered none.

It should be constantly borne in mind that the success of the operation depends wholly upon the satisfactory mobilization of the duodenum. If this mobilization is incomplete, suture strain with its disastrous consequences is inevitable. In certain cases satisfactory mobilization has permitted the use of this method after complete gastrectomy.

To summarize: Since the cause of ulcer is unknown and since its presence is a menace to the comfort and happiness, as well as to the life of the individual, who through its presence, is constantly exposed to the dangers of perforation, hemorrhage, etc., it would appear that resection of the ulcer would be indicated.

This, of course, is no guarantee that it might not recur later. It would appear also that that form of surgical procedure which disturbed least the normal physiological relationship of the stomach, other things being equal, would be the method of choice. Beginning with these two general propositions, therefore, pyloroplasty or gastro-duodenostomy, associated, where possible, with resection of the ulcer, would be the procedure of choice. The particular method of accomplishing this would be determined by the conditions present at operation. The acceptance of these general propositions would relegate to second or third choice the operation of gastro-enterostomy, or extensive gastric resection. I am quite aware that this position is not that held by the majority perhaps of general surgeons, but our experience with all types of operations upon the stomach and duodenum has convinced us that, in our hands at least, the best results, both immediate and late, are secured by the use of these methods. Where for any reason more or less extensive resection of the pyloric portion of the stomach is indicated, gastro-duodenostomy by the Haberer-Finney method, where practicable, is the operation of choice. Extensive resection of the stomach is reserved almost entirely for malignant disease. We are not convinced that the sacrifice of large portions of the stomach wall, interfering as this does with both motor and secretory functions of the stomach, is justifiable as a routine procedure. While in the hands of certain surgeons of skill and experience the results reported have been gratifying, still, in the hands of the average surgeon, the risks of such procedures would appear to contra-indicate their general use.

More important perhaps than almost anything else is the mental attitude of the surgeon in approaching an operation. It is a serious handicap to start in to operate with a fixed determination to do a certain form of operation, no matter what the conditions may prove to be. It is bad judgment and worse surgery to attempt to push any operative procedure beyond its natural limitation. One but courts disaster in so doing. The open mind should be the mind of the surgeon. First to establish the facts, then to employ the particular operation that in his judgment is best adapted to the particular circumstances found. In this way his safety and the best end result.

SOME ASPECTS OF THE MEDICAL TREATMENT OF PEPTIC ULCER

HERBERT SWIFT CARTER

(Delivered before The New York Academy of Medicine, November 4, 1926)

It is just as well to remember at the outset that medical treatment of gastric and duodenal ulcer antedates the surgical by several centuries and that it is only within the last 25 years or so that the treatment by surgery has come into extended use. To illustrate how recent it is, the writer saw a patient, in about 1904, with complete pyloric stenosis from ulcer, die in tetany with an enormously dilated stomach. Only a few weeks before, he had been told by no less an authority than the elder Janeway, who was admittedly conservative, that surgical relief for his trouble (presumably gastro-enterostomy) was too hazardous a procedure and that he had better be content to live as long as he could without giving that dubious form of relief further thought. Since then, surgery has made enormous strides, and great honor is due to those whose work has placed certain surgical forms of relief on such sure footing. At the same time, it must be recognized that the tendency in surgery has been steadily in the direction of more and more radical measures. The effect of this policy has been to subject the results to a more searching analysis, and ample evidence is at hand that there is a slow but certain swing of the pendulum toward medical relief, at least, as a thorough preliminary to all surgery, except in the presence of certain types of ulcer and complications.

No longer than ten days ago, a well known surgeon in this place (Academy of Medicine) made the statement that very few ulcers should be treated surgically but that they should almost all be treated medically. This statement, like many of its kind, while perhaps not accurate, only serves to bring to our attention the fact that surgical cures for ulcer often leave much to be desired. There is no doubt, on the other hand, that if one were to take a poll of those in the audience interested in the medical care of these cases, it would show that a large majority are fairly content with their results. That this is a fact will be brought out later.

The task of presenting some aspects of the medical treatment of peptic ulcer is not inconsiderable and one would hardly attempt to do so, were it not for the fact that there is a good deal of difference of opinion as to what the proper medical treatment should be, as there is, as yet, no standard method, but great lack of unanimity on the subject. Some object to the inclusive term "peptic ulcer," but it has long been used to designate these ulcers, whether situated in the stomach or in the duodenum, and, although open to some objection, it is probably as useful as any other name used to describe them.

In attempting to formulate a rational plan of medical treatment, one must be familiar with the etiology of ulceration as found in the stomach and duodenum as far as it is known. At the outset, we are confronted with a lack of specific knowledge of the steps that lead to its formation. When we talk of local interference with the blood supply followed by auto-digestion, we may be quite correct, but there are processes involved of which we know little.

We know that there is an ulcer type of individual, and Draper has shown by his anthropological studies that the vast majority of ulcers occur in people of a certain general physical make-up. These characteristics may be summed up under physical and neurological features. Under the former, one finds the thin individual, tall rather than short, with long face and moderately pointed chin. The anterior dental arch is narrow; the central incisors larger than the lateral; the costal angle acute, with a tendency to abdominal ptosis; in short, the asthenic type of person. This is in marked contrast to the *so-called* gall bladder type, which has almost diametrically opposite characteristics, *i.e.*, shorter, thick set, broad anterior dental diameter, etc.

The neurological characteristics of these ulcer subjects are also more or less typical. They are usually high-strung, active, and often neurasthenic. The opposite qualities characterize the gall bladder type.

While hardly sufficient evidence on which to base a differential diagnosis, these two types are quite distinct, and their recognition very helpful in diagnosis of the border-line case. Of course, these cases overlap, and some gall bladder patients also have ulcer, and vice versa. This is comparatively rare, however, and

I can think of only three such instances in my own experience. So much for the predisposing causes. As to pathological somatic conditions, more or less associated in a causal rôle, we find Smithies' classification helpful, *e.g.*

1. Infections (chronic and acute).
2. Arteriosclerosis.
3. Visceral hypertonia (vagus or splanchnic hyperfunction).
4. Chronic general anemia (so-called "chlorotic").
5. Syphilis.
6. Visceral hypotonia (vagus or splanchnic hypofunction).
7. Postoperative.
8. Industrial intoxication (occupational poisonings).
9. Metabolic dysfunction (thyroid, suprarenal, pituitary, etc.).
10. Trauma.

As to just how these two sets of factors work together toward the formation of ulcer, we are still in the dark, particularly as it is very difficult to find any connecting link that completes the chain. To show what is meant, we have only to think of these same etiological factors of Smithies' as present in numberless other people of a different physical habitus, but who do *not* show the clinical phenomena of ulcer. These factors, then, must all be taken into consideration, not only in making the diagnosis, but in carrying out the details of treatment.

One can leave out of this discussion much in regard to acute ulcer, as all such cases, unless specially complicated, should be treated medically. Even the surgeons, to whom we owe so much of what we know concerning the life history of ulcer, agree to this. It is a fact that such cases do well, for the most part, if carefully dieted and treated by any good method, and this fact has, no doubt, accounted for the many cures designed and advocated by various authorities, each one of which may well gain the desired result in cases of acute ulcer. This is reasonable, for we know that acute ulcers, artificially produced in animals, tend to heal spontaneously, and that it is difficult to produce the persistent and chronic type.

The treatment of chronic peptic ulcer (gastric or duodenal), on the other hand, is a very different matter, and offers many

difficulties, both in the choice of method and concerning the necessity for long-continued supervision.

Some years ago in going over the hospital records of the ulcer cases treated medically, one was struck by the frequency with which these patients returned for subsequent treatment, or whose names were found in the surgical records, as having come to operation.

There is a feeling, more or less general, that unless these hospital patients fall into the hands of internists reasonably interested in the care of such cases, who are willing to pay attention to the more minute details of treatment in the hospital, and who are also willing to follow them up for months afterward with encouragement and advice as to their care of themselves and their diet, many of them do not remain well, although they usually lose their symptoms promptly. This is in contrast to patients who can have every care, and a thoroughly supervised after-cure for months. It is in behalf of the people who spend three or four weeks in a hospital ward, on one or other of the routine dietary methods, but who do not get permanent results, that an especial plea is made.

It may well be argued whether many of these ward cases of chronic ulcer should ever be treated medically (except on account of some adverse associated condition), as they usually have neither the time nor the money to spare on such a necessarily prolonged régime. Even the majority of surgeons agree, however, that in the absence of definite complications, most cases should be given the chance of a medical cure. The reasonableness of this course is emphasized by the considerable number of surgical failures and by the occasional loss of a case from pulmonary or other complications.

Given a case that is to be treated medically, what procedure offers the most favorable chance of cure? In order to arrive at some definite conclusion, the writer followed these two lines of procedure:

1. A questionnaire was sent to all the members of the American Gastro-Enterological Association and a few other gastro-enterologists.

2. A questionnaire was sent to all the patients who had been treated medically, for peptic ulcer, in the wards of one of the

large hospitals of this city, from 1916 to 1924, to determine what proportion of them had remained symptom free. The returns of this second class have come in too slowly to be made a profitable part of the discussion, but will be dealt with in a later paper.

In the first questionnaire, an arbitrary period of two years was taken as representing the probability that the case was cured or arrested if it had gone at least this period symptom free. While, of course, there is no such hard and fast rule, it represents in practice a very fair approximation to the truth.

In analyzing the replies from the first set of questions—that sent out to the members of the Gastro-Enterological Association—many interesting points are brought out. I wish, first of all, to acknowledge my indebtedness to these gentlemen for their courtesy in replying, often at considerable length, and with evident interest. Replies were received from fifty-one men, and as they are all recognized as being among the best gastro-enterologists in the country, the high quality of their replies speaks for itself. As a very conservative estimate, it may be assumed that these men have probably treated an average of 200 cases of ulcer—some many more—but with an average of 200, the results of this questionnaire may be considered as based on approximately 10,000 cases—a large enough series to be of value.

To analyze the questions that were sent out, in detail:

1. What form of treatment do you use?

The answers to this question showed a striking variety of methods; most of the replies were definite, but some rather indefinite, leaving one to draw one's own conclusions. They might be listed somewhat as follows:

1. Duodenal feeding.....	4	7.0%
2. High fat diet.....	2	3.5%
3. Sippy diet.....	9	15.8%
4. Modified sippy diet.....	12	21.6%
5. Fluids and soft foods with alkalies.....	6	10.5%
6. Fluids and soft foods without alkalies.....	5	8.0%
7. Lenhartz.....	1	1.7%
8. Leube or modified.....	4	7.1%
9. Bland diet.....	7	12.5%
10. Medication other than alkalies.....	5	8.8%
11. Rectal feeding at start.....	2	3.5%
12. Frequent feedings..... (all)		100.0%

The most interesting finding disclosed by this report is that by these various diets the results of treatment were all much the same. On seeking for a common denominator, one must reach the inevitable conclusion that there are two factors only that were held by all in common, *i. e.*, (1) Frequent feedings and (2) fluid or soft diet at the outset and for a variable length of time. This throws us back to the older treatments of many years ago, except for the fact that then most cases were given rectal feedings at the outset, and often it was as long as 10 to 14 days before mouth feedings were begun, especially in the cases of hemorrhage. Even then, when feedings were begun, they conformed to these two requirements. It makes one a bit skeptical about the value of this or that special form of diet, in the light of this knowledge, and the virulence with which one or another dietary cure is backed by its sponsor seems almost amusing. Nevertheless, it is probable that the different specific forms of diet cure are useful, because the particular form in which a man becomes interested and expert in giving, probably yields the best results in his hands, although no one form can claim any great superiority over the others. The storm center is about the use or not of alkalies, as those who advocate them do so with a good deal of vehemence, while those opposed are equally emphatic. The Sippy diet or some modification of it was used by 37 per cent. of all those who replied. It was also rather noteworthy that only four advocated the duodenal tube feedings. During the war this became a favorite method in the army and was given a good trial. Whether its infrequent use now is because of failures at that time, or just a matter of style—as there are styles in treatment quite as definite as in clothes, it is impossible to say. Only one of the replies favored the Lenhartz diet (modified), so popular ten to fifteen years ago.

Question 2. What proportion of cases after two years are 1st cured, 2nd partially relieved, 3d failures, 4th come to surgery?

When it comes to estimating percentages, we are on very uncertain ground, and no one realizes it more than the writer. At the same time, it would be impossible to get replies if actual statistics were required, so that although the method here pursued is open to grave criticism, it does offer a fair approximation

to the truth, for the errors are more or less equalized and the data furnished have much relative value.

Out of the definite replies, the following percentages of cures were found:

Type of diet	Cured	Partly relieved	Failures	To surgeons
Sippy	54%	The percentages of cases cured and of those that went to surgeons were the only reliable figures. The percentages of those partly relieved or of failures are not valuable, as some men listed the cured cases with those partly relieved and the failures with those who went to the surgeons.		
Modified Sippy.....	54%			20%
Duodenal feeding.....	64%			16%
Leube	60%			10%
High fats	62%			10%
Bland	48%			17%
Fluids and soft foods with or without alkalies	34%			18%
Results of all treatments taken together	56%			22%
				19%

These percentages of cure, no matter what method was used, show an inconsiderable variation except in the two middle classes, and seem to emphasize the fact that it probably makes little difference what type of diet is used, so long as it is fluid or soft and that frequent feedings are given. Two of the answers were of interest, (1) that better results of treatment were claimed for women than for men, (2) that it is probable that we do not get as many medical or surgical cures as we think we do.

The results shown in the "partly relieved" column vary greatly, as some men said that no cases were cured but all were relieved and others left out any reference to the percentage relieved.

The number of cases reported as failures ran very evenly for the most part, and those that finally came to surgery also varied little.

3. What is your experience with ambulatory cures?

The replies to this question were very surprising, and the results may be summarized as follows:

	%
(a) Those favorable to it as best or equal to any method	47
(b) Those who considered it doubtful or less satisfactory	26
(c) Those who considered it of little or no permanent value	27

In the writer's experience ambulatory cures have not been successful, although practically all patients thus treated lost their

symptoms promptly, for a time at least, but recurrence was the rule. However, putting patients on an ambulatory cure is a useful procedure as a preliminary diagnostic method, for the appendix and gall bladder cases do not respond so well, while the ulcer patients usually become comfortable and practically symptom free in two or three days, unless the ulceration is too extensive.

It has been thought very generally, in the past at least, that rest, both physical and mental, played a large part in the success of a cure, and it does seem difficult to believe that a patient may do as well while up and about carrying on his accustomed activities. Nevertheless, some of the men advocating the ambulatory cure (and they were nearly 50 per cent. of those making replies) are among the best known and most successful gastro-enterologists in the country. They evidently feel that the method is satisfactory at least in their hands. When we come to examine the table of results of ambulatory treatment as reported, we find that the percentage of cured is far below that of the cases treated by rest in bed, which is shown by this table:

	Cured	To surgeons
Ambulatory cases	32%	18%
Treated by rest in bed plus diet	61%	14%

The percentage of cases going to the surgeon shows only a slight difference.

Question 4. What is your impression regarding the frequency of the disappearance of the nitche or other x-ray evidence of ulcer after medical treatment?

The replies to this question were difficult to tabulate, as perhaps it was worded too indefinitely, but the definite answers may be tabulated as follows:

Gastric		Duodenal	
Nitche remains	2.3%	Nitche remains	18.5%
Nitche disappears partly or entirely	11.6%	Nitche disappears partly	12.6%
Nitche disappears and re- turns	6.9%		

These figures, of course, refer to the percentage of the answers favoring the disappearance of the nitche or not, and not to the

amount of the nitche's disappearing or remaining. Two of the men felt that all nitches disappear (unless very large) although some return. Others consider that the nitche persists in spite of a clinical cure, and one very careful observer, who, although a clinician, makes his own x-ray examinations, feels that if the nitche does not appear there is a great chance of recurrence. Still another thinks that the gastric nitche often disappears too soon to be an indication of complete healing. Taken altogether, the general consensus of opinion seems to be that the gastric nitche disappears fairly readily, but it may return; that once a duodenal defect is made, it is rarely completely obliterated whether thoroughly healed or not. The whole question, however, shows considerable difference of opinion which undoubtedly is warranted by the diversity of findings.

Question 5. What is your impression regarding the efficiency of hospital ward treatment versus private patient treatment?

Of the forty answers to this question, 77 per cent. find the treatment of private patients more satisfactory, while 23 per cent. feel that the ward cases fare as well or better. This deduction is quite in line with what one would expect, as the private patient is usually able to carry out the treatment more intelligently and to continue longer under medical supervision, both of which factors are of primary importance in effecting a permanent cure. This serves to give force to the statement made earlier in the paper that ward cases do not do as well as they might. The causes of this condition may lie partly in the lack of specific care and partly in the inherent social condition of the patients, less able to spend time and money on what must necessarily be a long period of dietetic care.

Question 6. What degree of pyloric stenosis has been satisfactorily overcome in your experience?

The replies to this question showed almost unanimous response that no case of true organic stenosis is cured by medical means. Some patients are partially relieved of their symptoms, and when there is an underlying cicatricial stenosis with added swelling, round cell infiltration or spasm, these latter features may be relieved by proper diet and lavage, even when they are extreme, resulting in actual gastric stasis. The cases that are due to swelling and spasm only may be entirely relieved by medical treatment.

CONCLUSIONS

Recapitulating the conclusions brought out by this investigation, they may be summarized as follows:

1. The Sippy treatment or some modification of it was used by 37 per cent. of the clinicians.

2. Frequent feedings, and fluid and soft diet were the only common features of all the treatments used, and would, therefore, seem to be the most important factors in bringing about a cure.

3. Rest, and these latter features in the cure, no matter what the specific form of treatment used, gave better results than the same features used in ambulatory cases.

The average percentage of results in all forms of treatment was: Cured, 56 per cent.; to surgery, 19 per cent. The statement was almost unanimously made that success also depended largely on long-continued dietary control.

4. The niche very frequently disappeared in 52 per cent. of the cases of gastric ulcer, unless too large a pouch had been formed. In some cases the niche disappeared early. The duodenal niche rarely, if ever, disappears entirely, although it is usually reduced in size if the progress of the treatment is satisfactory.

5. The results of treatment are better in private patients than in hospital ward cases.

6. Organic cicatricial stenosis is rarely or never cured by medical means, whereas stenosis due to swelling and spasm may be entirely relieved by appropriate diet and treatment, even if it is extreme, resulting in actual gastric stasis.

Discussion

W. W. PALMER

I can heartily agree with what Dr. Carter has said regarding the aspects of the medical treatment of peptic ulcer. In this connection I would like to report, briefly, a case which came under my supervision three years ago.

An unmarried woman of 59, with a severe psychosis who gave a history quite characteristic of gastric ulcer of some 9 months' duration, revealed on physical examination an extreme sensi-

tiveness just above the umbilicus, and on gentle palpation a mass could be made out which was very tender. There was no spasm of the abdominal muscles. The G. I. series revealed a very large, perforating ulcer of the lesser curvature of the stomach. The sac, as nearly as could be made out, was at least 4 cm. long and 3 cm. wide. The temperature was normal, but there was a leucocytosis of 18,000, with a polymorphonuclear count of 70 per cent. On account of the severe psychosis, and since she was to be under close observation, it was decided not to operate immediately, as one is inclined to do, I think, in similar, uncomplicated cases.

On a modified Sippy régime, the symptoms subsided very promptly, the tenderness in the abdomen diminished, and within a month the mass was no longer palpable. An x-ray examination at this time revealed a very much smaller sac, measuring approximately 5 x 8 millimeters. The patient continued to do well, and a third x-ray plate was made in another month when Dr. Golden reported that "the projection on the lesser curvature is so small and shallow that measurements are unsatisfactory." This patient continued free from gastric symptoms for a year, when she died as the result of an accident. An autopsy was performed and the stomach removed. There was still a very small, shallow ulcer, 3 x 5 mm. and 2 to 3 mm. deep.

This illustrates what may be done in instances of this kind with medical care.

Two other cases may be reported which gave similar histories, so far as the progress of the perforating ulcer is concerned. In one case the patient died of carcinoma of the right bronchus, and a healed ulcer of the stomach was demonstrated. In the other case there was shown on x-ray examination a large sac on the lesser curvature at least 5 cm. across the mouth which diminished on medical care within one month to an area of only 3 to 5 millimeters in diameter with normal peristalsis passing over it.

Dr. Carter has emphasized the essentials in treatment, frequent feedings and a bland soft diet. The details of accomplishing this seem to me relatively unimportant. No two cases can be treated in exactly the same manner. In every instance the dietary régime must be adapted to the individual patient.

I have always had tremendous respect for dear old Dr. Welch, but I have more respect now than ever for the prophetic vision of this famous man since Dr. Finney told us to-night that as long ago as 1885 he allotted eight pages to the medical treatment of ulcer in his book and but one page to the surgical. Dr. Finney says that operation is advisable because of fear of hemorrhage, perforation and change to cancer. I have had more cases of hemorrhage in patients after operation than in all the cases I have treated medically. I have had only two cases with hemorrhage while under my medical treatment and one of these that I had operated upon had a severe hemorrhage two weeks later. I have never had a case of perforation in any case that underwent proper medical treatment, but I have had a number of cases brought to my attention by surgeons, where perforation had occurred after a prior operation and where a gastroenterostomy stoma was normally and properly operating. Aside from the marginal ulcers we have many cases where new ulceration has developed following gastroenterostomy, the most frequently performed operation; that is, in the presence of the condition established to cure an ulcer a new ulcer has developed. That happens over and over again. A case reported to me to-day is one in which perforation had taken place. A gastroenterostomy had been done and recently the ulcer perforated again in the very same place. It is now two years since the primary operation. So surgery is not a sure preventive of hemorrhage and perforation. One radical surgeon recently reported 9 per cent. of mortality in 150 cases. If the most celebrated operators have a mortality of 9 per cent., what is the mortality going to be with the other surgeons who have less experience? Are you going to tell your patient whom you advise to be operated upon that he has a 9 per cent. chance to die from the operation? The surgeon thinks of that 9 per cent. when he himself has an ulcer and does not have an operation.

Then about cancer. We have no evidence that an ulcer healed by medical means is more prone to develop into cancer than the ulcer healed by surgical means. In the ordinary ulcer case we do not act as if in fear of cancer, though we have it in the back of our minds, and such case usually heals under medical treat-

ment. Therefore the claim of surgeons that they alone forestall the development of cancer ten years from now is not well founded. If because of the fear of cancer it were the custom to operate on all cases of gastric ulcer the mortality would be quite high; it would be more than the mortality from cancer that may develop in a possible 5 per cent. of the cases, or even more—though I doubt it. We think we can cure ulcer by medical treatment in the majority of cases, and it seems to me we have no right to advise a patient to have surgical treatment unless we can tell him that the probable dangers and disadvantages are distinctly less than they will be from non-operative procedures.

There is one other point. There are a fair number of cases that are undoubtedly surgical from the outset, and in these cases it is futile and wrong to promise help from medical treatment. But in the other cases we go on and treat them medically and if we fail to get them well we say we will try surgery. I have so often heard this remark at meetings and the audience might get the impression that surgery is sure if medical measures fail. They might then reasonably argue that if surgery is sure why not try that first. But we know that surgery is not sure. It has a high mortality. Dr. Peck reported 8.8 per cent. deaths following gastroenterostomy. Deever's published statistics revealed a mortality of 14 per cent. in gastric ulcer cases within a year of operation. Beckman and White reported 10 per cent. operative mortality with various surgeons of Cincinnati. That is the mortality alone. The morbidity is even higher. Deever reported one case that had undergone four operations for marginal ulcer, and upon whom he was about to perform a fifth operation. Lewisohn reports a similar case that had four operations in six years.

In my opinion therefore certain cases are medical and certain cases surgical; but there is a fairly large group that can be considered surgical only after thorough medical treatment has been tried, and in that group surgery is not by any means successful in 100 per cent. of the cases.

JOSEPH A. BLAKE

The discussion of whether there should be operation or treatment of ulcer medically always interests me. It brings out quite a bit of feeling. I came here tonight to hear Dr. Finney's ideas about the treatment of ulcer. I felt that there was doubt as to the proper treatment. I do not blame the medical men for the stand they take because, as Dr. Finney says, the surgeon has been apt to follow the procedure already arranged in his mind. That has been done with gastroenterostomy and that makes the medical man feel that the surgical treatment of ulcer is unsuccessful. I believe that gastroenterostomy is not the proper operation except under certain conditions. A man should approach an operation with an open mind, without making up his mind previously as to what he is going to do, and should operate on ulcer of the stomach according to the ulcer's character. In recent years I have excised all the ulcers I could and when near the pylorus have done some form of pyloroplasty. I felt that getting rid of the ulcer was the main thing. Whether the ulcer forms again is another matter. Many ulcers undoubtedly do recur; marginal ulcers produced by improper operations, and some others.

There are several things that occurred to me while listening to the discussion this evening. Dr. Bastedo said that the surgeon who has ulcer does not have operation. I wonder how many medical men with ulcer adhere consistently to medical treatment. Some of the medical men who are here to-night have gone to surgeons for treatment. I do not think the question can be cut and dried, but the point I want to make is that the operation hitherto done should not be considered a basis as to what is the best method of treating a given case.

I should like to express my admiration and appreciation of the papers. I have learned more from Dr. Finney's paper to-night than from any I have ever heard, and I have heard a great many.

Abstract of paper read before the Section of Obstetrics and Gynecology, October 26, 1926

THE EFFECT OF ROENTGEN RAYS UPON THE OVARY, AN EXPERIMENTAL AND MORPHOLOGIC STUDY, WITH CLINICAL DEDUCTIONS

M. R. ROBINSON

Systematic histologic studies of irradiated rabbit ovaries, at weekly intervals, for a period of seven weeks showed that the tertiary follicles are the most vulnerable to the effect of Roentgen rays, and that the ovule is the most sensitive part in the follicle. The primary follicles are not affected by a castration dose and can therefore continue to ovulate as soon as the effect of the irradiation is over, and should impregnation follow irradiation a normal pregnancy and normal ~~child~~ ^{offspring} may be expected.

The fear that irradiated women will give birth to monsters or mentally defective children has thus far not been substantiated by experimental or clinical facts, and it may therefore be considered as purely hypothetical in nature.

Temporary castration can be accomplished at all ages, the dose is inversely proportional to the age of the female, the older the woman the smaller the dose required. Temporary sterilization should be employed whenever a suspension of ovarian function becomes a clinical indication.

Abortions can be induced with Roentgen rays, and with much smaller doses than is necessary to sterilize. Should the expected abortion not ensue, it becomes imperative to empty the uterus, for fear that a defective child may be born.

The follicular damage sustained from irradiations during pregnancy is far more extensive and involves all the follicles. If permanent castration is not desired at the time of the induction of the abortion, it can be avoided, by irradiating the uterus only.

Abstract of paper read before the Section of Laryngology and Rhinology, October 27, 1926

PREVENTION AND CORRECTION OF NASAL DEFORMITIES FOLLOWING SUBMUCOUS RESECTION

JACQUES MALINIAK

Submucous resection of the septum is one of the commonest nasal operations. In frequency it stands next to tonsillectomy and we can well believe that with the constant increase in specialization, the number of these operations will grow greater.

This fact should be all the more emphasized since aside from the ordinary risks occurring to any surgical intervention, the complications which may follow here are particularly serious because of the possibility of nasal disfigurement. The relation of cause and effect is too evident to the patient to free the rhinologist from blame. What renders the problem very delicate is that a nasal deformity may sometimes result after a submucous resection is done by a skilled rhinologist.

We should, therefore, be inclined to suppose that in certain cases the post-operative nasal disfigurement might be attributed to a specific weakness of the remaining cartilaginous bridge. This might happen especially with delicate women and children. In the latter under a certain age (16 years) a submucous resection might be followed by deformity on account of disturbance in the normal development of the nose. The question of accidental post-operative trauma might also be considered. In the majority of cases, however, the operative technique is at fault.

These deformities are of four types:

1. Retraction of the columella with lowering of nasal tip.
2. Limited dorsal depression.
3. Flattening of the nasal tip.
4. A combination of the latter two.

A careful study of the nasal architecture is necessary to avoid these post-operative complications.

ANATOMICAL CONSIDERATIONS

Bony Nose.—The nasal framework consists of a bony and cartilaginous portion, each of which has a very different role in the

nasal architecture. The osseous portion is firm, immobile and acts as a frame and support for the cartilaginous portion. The nasal bones with the ascending limbs of the maxillary bones are firmly wedged by their upper borders into the opening of the frontal. The strong nasofrontal union is enough in itself to withstand the bending of the nasal bones and could in no way be compromised by a too extensive resection of the perpendicular plate. The latter is in relation above with the lamina-cribrosa and thus becomes important in prophylaxis of possible meningeal complications in the course of a submucous resection. The vomer is in contact with the anterior nasal spine at its antero-inferior end, and this relationship is of great practical importance since it is there that the free border of the quadrangular cartilage, which is the support of the nasal tip, is inserted. In the course of a submucous resection, the thickened and deviated vomer is submitted to a more or less extensive resection and often the neighboring nasal spine is sacrificed in toto. Of necessity, a sinking in of the cartilaginous pillar results with drooping of the tip. The fibro-cicatricial tissue which is formed subsequently increases the retraction of the nasal tip. An economical resection of the nasal spine by paring it off sagittally will avoid the consecutive flattening of the nasal tip.

Cartilaginous Portion of the Nose.—The cartilaginous portion is of even greater importance. It is the part which is subjected to all the damage in post-operative deformities. The quadrangular cartilage, wedged into the bony structures mentioned above, ends by its free border above the alar cartilages enclosed in the columella. This free portion of the cartilage is frequently resected during the submucous operation. This should be strictly avoided. On the dorsum, below the nasal bones, the quadrangular cartilage of the septum is continued laterally by the triangular cartilages and unites with them in the median line. These two cartilages thus form a protection for the septum in the median line and serve at the same time for the suspension of the septum by their insertion at the aperture. The thickness and size of these triangular cartilages diminish below and they finally end by diverging from the median line at $\frac{1}{2}$ to 1 cm. above the top of the alar arches. The rhomboidal space thus formed appears in the normally constructed nose as a slight depression situated immediately above the nasal tip.

Costal cartilage should be used in all cases of nasal reconstruction if it is available. We have used this substance for the last eleven years with success. Once transplanted, the cartilage forms part of the surrounding tissues and continues to live without absorption. Medium sized dorsal depressions are sometimes successfully corrected by auricular cartilage. Costal cartilage is to be used for the correction of more pronounced deformities. It should be removed through a vertical incision of the thorax from the sixth or seventh costal cartilage, avoiding horizontal incision of the muscle fibers, and thereby also avoiding post-operative pain. Bony transplants, from whatever place they are taken, have not given us satisfaction on account of their late absorption.

In patients who refuse to furnish their own cartilage and in pronounced nasal deformities ivory may be used. However, it is preferable to have the nasal dorsum, especially its cartilaginous portion, reconstructed with a yielding living substance like cartilage.

1. The dorsal depression without flattening of the tip should be corrected only by a dorsal transplant. A divided graft, extolled by some for the correction of this deformity, is a mistake on account of the nasal architecture. We have observed artificial angulation and doubtful cosmetic results in cases operated on in this manner.

2. Flattening or retraction of the tip due to an extensive resection of the nasal spine or quadrangular cartilage is to be corrected by transplantation of a cartilaginous support for the columella.

3. The flattening of the tip accompanied by a dorsal depression is corrected by a single angulated transplant. The two fragments, the long one for the dorsum and the short one for the columella, are united at the region of the cut by the perichondrium which corresponds to the nasal tip.

In all this work, the surgeon has to be guided to a great extent by his artistic inclination.

*Abstracts of Paper Read before the Section of Ophthalmology,
October 18, 1926*

CLASSIFICATION OF RETINAL DISEASES: RETINITIS EXTERNA AND CHOROIDITIS

MANUEL URIBE TRONCOSO

A new classification of certain affections of the retina and of the choroid is needed in order to clarify the confusion arising from the use of the terms chorio-retinitis and retinitis. Retinitis as applied indiscriminately to all affections of the retina is a misnomer; a more accurate term, except where there is a distinct evidence of inflammation, would be *retinosis* (Osis-condition of). Affections of the inner layers of the retina would then be classified as *Internal Retinosis*. Those which primarily involve the outer layers and are confined for a long time to that portion of the retina, would be grouped under the heading of *External Retinosis*. When both the choroid and retina are involved, there is chorio-retinitis. When the choroid alone is affected, especially in the early stages of the disease, the term *Choroiditis* is properly applied.

Pathology of External Retinosis.—The pathological changes which take place in external retinosis are described as they affect the pigment epithelium, the rods and cones, the lamina vitrea and the optic nerve. The pigment epithelium reacts to injury either by atrophy and complete absorption or by proliferation. When there is complete absorption a pathological tessellation appears, (high myopia, glaucoma, etc.). This is called a superficial depigmentation. Sometimes the breaking down of the cells gives out pigment granules which are dispersed (pepper and salt fundus). When proliferation takes place, the pigment either stays in place or migrates into the inner layers of the retina and is deposited around the small superficial retinal vessels and capillaris, in the typical shape of bone corpuscles, spiders or a lace-like pattern, as are found in the so-called "Retinitis Pigmentosa." To this superficial pigment spots the author gives the name of *Perivascular retinal pigment*. They can be observed also in several forms of external retinosis and in the last stages of chorio-retinitis. The pigment may sheath and cover the

larger vessels or fill a cavity formed in an atrophic area. In the latter case it takes on a round or irregular shape.

The rods and cones also atrophy either as a result of a sclerosis of the chorio-capillaris or of an independent degenerative condition (an abiotrophy) originating in the external layers on the retina. Degeneration may extend to the inner layers of the retina on the one hand and on the other to the choroid itself. The choroid and retina become attached by new connective tissue facilitating a passage of the pigment to the inner retinal layers. In inflammations of the choroid because of the impermeability of the lamina vitrea to cellular exudation and bacteria, the focii remain confined to the choroid and the distinction between choroiditis and external retinosis is, in the beginning at least, well marked.

Colloid excrescences are seen in some cases of external retinosis, in old cases of choroiditis, and in several other affections. Atrophy of the rod and cone layer produces an ascending degeneration which may involve the ganglion cells, and results in atrophy of the fiber layer and finally of the papilla itself. (Retinitic atrophy.)

Differential Diagnosis.—The important diagnostic points between external retinosis and choroiditis are: In external retinosis, there are no signs of active inflammation, nor atrophic white spots; the pigmentation that is present is superficial and perivascular and depigmentation exposes normal choroidal vessels. In choroiditis, however, there are present focii of active inflammation which, in later stages, form white atrophic spots. Pigmentation is in irregular shaped spots and occurs in the deeper layers. Only in the more advanced or in the last stages the pigment migrates to the surface.

The following groups of diseases affecting the outer layers of the retina are included as typical of *External Retinosis*:

- 1st. Changes due to hereditary syphilis.
- 2nd. Pigmentary retinosis (non-luetic).
- 3rd. Pigmentary retinosis without pigment.
- 4th. Retinosis punctata albescens.
- 5th. Macular pigmentary retinosis.
- 6th. Hereditary hyaline infiltration of the retina (Doyne).

The *first group* has three types: (a) Pepper and salt or snuff fundus; (b) Coarse pigment and yellow spots; (c) Pigmentary retinosis of hereditary lues. The *second group* is made up of the primary type of pigmentary degeneration of the retina. This is an external retinosis which starts in the first neuron and then involves the inner layers of the retina. The pigment travels to the surface and deposits around the vessels, which atrophy. The optic nerve also atrophies in later stages of the disease. The early onset of hemeralopia is indicative of the changes which take place in the rods. In the *third group*, the abiotrophy possibly involves both the rods and cones and the pigment epithelium at the same time. The *fourth group*: The functional symptoms and its characteristics warrant its classification with external retinosis.

The *fifth* is a heterogeneous group and includes: (a) central tapeto-retinal degeneration (Leber). (b) Symmetrical macular pigmentary degeneration (Batten & Mayou). (c) Progressive family macular degeneration (Stargardt). (d) Familial retino-cerebral degeneration (Gifford). All these have in common pigmentary changes which on account of the lack of vessels in the macula take the form of round spots. These macular changes may or may not be associated with the degeneration of the brain, and occur in members of the same family. No inflammatory or atrophic foci are observed. The functional symptoms vary from impairment of central vision and day blindness to central scotoma and total blindness. The *sixth group* differs from the types above described only by the progressive character of the white spots, which form large patches.

Chorio-Retinitis.—When the changes are not confined to the external layers of the retina but involve the choroid as well, we call them chorio-retinitis. There is a great variety of types, as in fact this is the last stage of all choroidal and retinal diseases. The primary conditions are:

- (a) Chorio-retinitis syphilitica (Foerster)
- (b) Chorio-retinitis myopica
- (c) Chorio-retinitis sympathica
- (d) Chorio-retinitis by congenital lues (pseudo-albinism)
- (e) Atrophia gyrata (Fuchs)
- (f) Photogenus and actinic

Three types are only described: 1st—The Pseudoalbinosis of congenital syphilis in which the depigmentation involves both membranes and there is superficial or perivascular pigment spots.

2nd—The so-called "Secondary retinitis pigmentosa," which is the last stage of many cases of chorio-retinitis, usually from acquired lues.

3rd—The atrophía gyrata choroidea and retinae, of Fuchs.

Choroiditis.—In the first stages the inflammation is confined to the choroid alone. This membrane reacts to infection; 1st, by localized foci, 2nd: by diffuse inflammation, 3rd: by vascular degeneration, 4th: endophthalmitis. It is especially in the second and third types that a secondary migration of pigment to the surface of the retina takes place in the cicatricial stages.

PROCEEDINGS OF ACADEMY MEETINGS

STATED MEETINGS

November

Thursday evening, November 4, at 8:30 o'clock

Program presented in cooperation with the Sections of Medicine and Surgery.

ORDER

I. Executive session.

a. Communication from the Council.

b. Report of the Nominating Committee.

Nominations for President, one Vice-President, Treasurer, two Trustees, member of the Library Committee, member of the Committee on Admission.

II. Papers of the evening.

a. The surgical treatment of gastric and duodenal ulcer, John M. T. Finney, Baltimore (by invitation).

b. Some aspects of the medical treatment of peptic ulcer, Herbert S. Carter.

Discussion, Walter W. Palmer, Walter A. Bastedo, Joseph A. Blake.

The papers of the evening, also discussions, are published in this number of the Bulletin.

Thursday evening, November 18, at 8:30 o'clock

ORDER

- I. Executive session.
Election of Honorary Fellows.
- II. The Wesley M. Carpenter Lecture, Ionization and chemical reactions, Michael I. Pupin, Columbia University (by invitation).

SECTION MEETINGS

October

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday evening, October 27, at 8:30 o'clock

ORDER

- I. Reading of the minutes.
- II. Presentation of cases.
 - a. A case of antral sinusitis complicated by radium poisoning, Frederick B. Flinn (by invitation).
 - b. A case of lung abscess following tonsillectomy, J. D. Whitham (by invitation).
- III. Paper of the evening.
The prevention and correction of nasal deformity following submucous resection, Jacques Maliniak (by invitation).
Lantern slide demonstration.
- IV. General discussion.
- V. Executive session.

Abstract of the paper by Dr. Maliniak is published in this number of the Bulletin.

November

SECTION OF DERMATOLOGY AND SYPHILIS

Monday evening, November 1, at 8:15 o'clock

ORDER

- I. Presentation of patients.
 - a. From The University and Bellevue Clinic.
 1. Urticaria pigmentosa.

2. Lupus erythematosus.
3. Darier's disease.
4. Lichen planus annularis.
5. Multiple epithelioma (two cases).
6. Erythema elevatum diutinum.
7. Acrodermatitis chronica atrophicans.
8. Morphea.
9. Tertiary syphilis, severe.
10. Hydroa vacciniforme.
11. Leprosy.
12. Xanthoma diabetorum.

- Howard Fox, Edward R. Maloney, Walter J. Highman, Max Scheer, J. P. Thornley.
- b. Cases from Vanderbilt Clinic, and the service of Mihran B. Parounagian, Bellevue Hospital Syphilis Dispensary.
 - c. Miscellaneous cases.

II. Demonstration of instruments.

Demonstration of the cryo-cautery (Lortat-Jacob), Howard Fox.

III. Discussion.

IV. Executive session.

SECTION OF GENITO-URINARY SURGERY

Combined meeting of the Section with the New York Society of the American Urological Association
 Wednesday evening, November 3, at 8:30 o'clock

ORDER

- I. Reading of the minutes.
- II. Presentation of new instruments.
 A special catheter for uretero-pyelographic study and aseptic catheterization of the kidney, S. R. Woodruff.
- III. Papers of the evening.
 - a. X-ray therapy in urology, William H. Meyer (by invitation).
 - b. X-ray in urology, Eugen Joseph, Berlin (by invitation).
- IV Discussion opened by Leon T. LeWald, H. M. Imboden, E. L. Keyes, J. F. McCarthy.
- V Executive session.

SECTION OF NEUROLOGY AND PSYCHIATRY

Combined meeting of the Section with the New York
Neurological Society

Tuesday evening, November 9, at 8:30 o'clock

ORDER

- I. Case presentation.
A case of multiple dural neoplasms, E. D. Friedman.
- II. In memoriam—Charles Bates Dunlap, George H. Kirby.
- III. Papers of the evening.
 - a. The changing manifestations of the neuruses, I. S. Wechsler.
Discussion by Louis Casamajor, Foster Kennedy.
 - b. Encephalitic amyotrophies, August Wimmer, Professor of Psychiatry and Neurology, University of Copenhagen (by invitation).
Discussion by Smith Ely Jelliffe, J. Ramsay Hunt.

SECTION OF PEDIATRICS

Thursday evening, November 11, at 8:30 o'clock

ORDER

- I. Reading of the minutes.
- II. Papers of the evening.
 - a. Essentials in the prevention of tuberculosis in infancy and childhood, S. Adolphus Knopf.
Discussion by Alfred F. Hess, Adolph G. G. DeSanctis.
 - b. The tuberculin skin reactions: a report on the incidence of positive reactions in 3,000 children, Charles Hendee Smith.
- III. General discussion.

SECTION OF OTOTOLOGY

Friday evening, November 12, at 8:30 o'clock

ORDER

- I. Reading of the minutes.
- II. Case presentation.
 - a. 1. Mastoiditis with Gradenigo syndrome before operation.

2. Mastoiditis with Gradenigo syndrome following operation, Jay D. Whitham (by invitation).
 - b. Case of temporal lobe abscess with hemiplegia and hemianopsia. Recovery.
- III. Papers of the evening.
- a. Pathology of brain abscess, Joseph H. Globus.
 - b. Diagnosis and treatment of brain abscess, Walter E. Dandy, Baltimore (by invitation).
- IV. Discussion by Charles A. Elsberg, Foster Kennedy, Isidore Friesner, Joseph E. J. King.
- V. Executive session.

SECTION OF OPHTHALMOLOGY

Monday evening, November 15, at 8:30 o'clock

ORDER

- I. Reading of the minutes.
- II. Presentation of cases.
 - a. 1. A case of posterior lenticonus with report of slit-lamp findings.
 2. A case of juxta-papillary coloboma of the choroid with unusual vascular arrangement, Elias J. Marsh.
 - b. A case of detachment of the anterior layers of the iris, Mark J. Schoenberg.
- III. Paper of the evening.
On protecting glasses with demonstrations, Joseph Imre, Hungary (by invitation).

SECTION OF GENITO-URINARY SURGERY

Tuesday evening, November 16, at 8:30 o'clock

ORDER

- I. Reading of the minutes.
- II. Presentation of cases.
 - a. Infarction of the testicle, Samuel Lubash (by invitation).
 - b. Case for diagnosis, H. L. Wehrbein (by invitation).
 - c. Stab wound of kidney. Unusual complication, Howard S. Jeck.

III. Paper of the evening.

Post operative results following vasotomy. A study of over seventy cases, Henry L. Kretschmer (by invitation).

IV. General discussion.

V. Executive session.

SECTION OF ORTHOPEDIC SURGERY

Friday evening, November 19, at 8:30 o'clock

ORDER

I. Reading of the minutes.

II. Presentation of cases.

- a. Meningococcus spondylitis, lumbar. 2 cases (from the Bronx Hospital, Sigmund Epstein.
- b. Osteochondritis of the knee joint causing recurrent dislocation of the patella (from Mt. Sinai Hospital), P. William Nathan.
- c. Tuberculosis of the spine with paraplegia, treated by fusion (from the N. Y. Orthopedic Hospital), A. DeF. Smith.
- d. 1. Congenital dislocation of the hip cured in infancy by author's brace, Charles H. Jaeger.
2. Bifurcation operation for old fracture of femur (from Lenox Hill Hospital), Charles H. Jaeger, Walter I. Galland (by invitation).
- e. Bone tumor of radius treated by x-ray (from Bellevue Hospital), Reginald H. Sayre, L. T. LeWald.
- f. A case of simultaneous strain of the sacro-iliac and lumbo-sacral joints (from the Hospital for Ruptured and Crippled), Percy W. Roberts.
- g. Transplantation of the trapezius muscle for paralysis of the deltoid (from the Hospital for Joint Diseases), Leo Mayer.
- h. 1. Pseudo-arthritis of the forearm cured by tibial inlays.
2. Tibial bone graft peg in ununited fractures of the neck of the femur (from Post Graduate Hospital), Fred H. Albee.

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday evening, November 23, at 8:30 o'clock

ORDER

- I. Reading of the minutes.
- II. Case reports.
 - a. An ovarian tumor with theca lutein cell characteristics, A. D'Esepe (by invitation), W. C. Johnson (by invitation).
 - b. Spontaneous rupture of a cesarian scar, Hervey C. Williamson.
- III. Paper of the evening.
 Etiology and treatment of rectocele, B. P. Watson (by invitation).
 Discussion by G. G. Ward, J. O. Polak.

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday evening, November 24, at 8:30 o'clock

ORDER

- I. Reading of the minutes.
- II. Presentation of cases.
 - a. Keratosis of vocal cord followed by malignancy, David H. Jones.
 - b. Bucco-antral fistula,—closure by plastic procedure, Irving W. Voorhees.
- III. Paper of the evening.
 Coagulation time prior to tonsillectomy, Westley M. Hunt.
- IV. General discussion.
- V. Executive session.

THE INSCRIPTIONS ON THE NEW BUILDING

It has been the aim of those interested in the construction of the new Academy to have it a building that would exhibit some special quality of dignity and academic signification. One of the measures—perhaps one might say—minor measures was that of having inscriptions upon the exterior of the building. About

VITA BREVIS—ARS LONGA—
EXPERIENTIA FALLAX—JU-
DICIIUM DIFFICILE

Life is short, art is long, experi-
ence untrustworthy, judgment diffi-
cult.

HOMINES AD DEOS NULLA
RE PROPIUS ACCEDUNT QUAM
SALUTEM HOM. DANDO. ACA-
DEMIA MEDICINAE NOVA
EBORACENSIS ANNO DOMINI
MDCCCXLIII CONDITA

Men in no way approach so nearly
to the gods as in giving health to
men

In lintels over windows

RES ARDUA VETUSTIS NOVI-
TATEM DARE NOVIS AUC-
TORITATEM

It is a hard task to give freshness
to the old and authority to the new

SANTARE ALIQUANDO SAEPE
JUVARE SEMPER CONSOLA-
RARE

(The doctor's task is) to cure some-
times, to help often, to comfort al-
ways

QUI SUI MEMORES ALIOS FE-
CERE MERENDO — UTILIS
ILLE LABOR PER QUEM VIX-
ERE TOT AEGRE

Men who by their merit have made
others remember them. That useful
labor by which so many of the sick
have lived

ET CAUSAE QUOQUE ESTIMA-
TIO SAEPE MORBUM SOLVIT

A consideration of the cause often
explains the disease

NULLA UNQUAM DE MORTE
HOMINIS CUNCTATIO LONGA
EST

There can be no long delay when
a man's life is at stake

aseptic and gave us the lofty code of ethics implicit in the "Oath" and the "Law." The Cnidians, on the other hand, misapplied what Jones regards as a "truly scientific method."¹ They mistook symptoms for diseases, described three kinds of tetanus and four kinds of consumption. The culmination of the tendency is apparent in the 191 varieties of syphilis described by Brassavola in the 16th century. Until very recently, fever, tremor, chorea, and paralysis were regarded as diseases rather than symptoms, and to-day we are wrestling with the anæmias, the jaundices, the rheumatic, gouty, pseudo-typhoid and pseudo-diphtheritic affections, the mixed infections, the pluriglandular syndromes and the baffling modalities of such major diseases as syphilis, tubercle or influenza. "The Cnidians," in the view of Jones, "were comparatively unsuccessful because they had not learned to distinguish the essential from the unessential. Hippocrates (he says) was a genius who followed a will-o'-the-wisp; the Cnidians were plodders along the dreary stretch of road that lies before every advance in knowledge. Hippocrates did the wrong thing well; the Cnidians did the right thing badly. . . . The truth seems to be that the peculiarly Hippocratic doctrines are of greater interest and value to scientists than they are to practising doctors." But in cases where insulin or salvarsan fail, where the physician is baffled by "the dim and half-seen signals of disease," the truth is perhaps the other way around. It is a fact, however, that the tendency of medicine in our own time has been essentially Cnidian—the medicine of the bacteriologist, the serologist, and the pathologist, rather than that of the bedside doctor. The minutiae of diagnosis and therapy have become more important than the patient himself.

In the 17th century, Sydenham, although a devotee of the Hippocratic or humoral pathology, inclined to the erroneous Cnidian view that each disease constitutes a definite species, classifiable as a botanist classifies plants. Although he made no special classification himself, Sydenham was, in theory at least, a forerunner of the 18th-century nosologists, who beginning with Linnaeus (1763), arranged diseases after the botanical method. The most remarkable of these was Cullen, who divided diseases into fevers, neuroses, cachexias and local disorders, differentiated

¹ W. H. S. Jones: Hippocrates, London, 1923, II, pp. XIV-XIX.

thirty-four kinds of chronic rheumatism and regarded even gout as a neurosis. Ludicrous as this view of gout may seem at first sight, it acquires a peculiar interest in the light of Charcot's investigations of gout and rheumatism. In the Tuesday Lectures of Charcot, (December 6, 1887),² the relation between gout and the neuroses is set forth in a novel light:

"We may regard arthritism as a tree, of which the principal branches are gout, articular rheumatism, certain forms of migraine, cutaneous affections, etc. On the other hand, there is a neuropathic tree, comprising neurasthenia, epilepsy, all insanities, hereditary or other, general paralysis, locomotor ataxia, etc. The two trees exist, side by side, communicating by their roots, and with relations otherwise so intimate that they may sometimes be mistaken for one and the same tree. With this key, you will understand most of the phenomena which come to pass in nervous diseases; without it, you will be unable to explain them. In dealing with a nervous patient, you should regard the malady before you as merely an episode. Thus, in a case of chorea, it is only necessary to inquire how long it has existed. The condition of the patient is only an accident in the history of the disease, just as each of us is only an accident in the history of humanity."

The immediate starting point of this line of thought was the teaching of such men as John Brown and particularly Broussais, whose greatest service to medicine was to dispense with the metaphysical or ontological conception of disease as a "clinical entity." Indeed, twenty years before Charcot's pronouncement, Clifford Allbutt, fresh from the clinics of Trousseau and Bazin, made a bold assault upon the fictitious notion of "clinical entities" with reference to the classification of skin diseases (1867).³ The motto of his article is a citation from Broussais, denouncing the vicious tendency to regard pathology as a science independent of the actual diseases it deals with.⁴

² Charcot: *Leçons du Mardi*, Paris, 1887-8, 39.

³ T. C. Allbutt: *St. George's Hosp. Repts.*, Lond., 1867, II, 187-204.

⁴ The extent to which this false view of pathology has gained ground in the popular imagination is indicated in H. L. Mencken's view of the pathologist as a terrier sniffing at ratholes. It is right and proper, however, that anatomy, physiology and pathology should be given separate places in public libraries, apart from medicine, as these basic disciplines are also correlated with general biology and its branches, with primitive plastic imagery and with the fine arts in general.

Allbutt points out at the start, that to regard a disease as a circumscribed clinical entity is no better than the savage's view of a disease as a particular "indwelling devil," nor do such later variants as "morbid principle," "virus," "bacillus" tell the whole story. He penalizes particularly such notions as "types of disease" or "typical cases," as being applied ordinarily to express, not the assemblage of differential characters common to a whole group (its lowest common denominator), but the logical opposites, *e.g.*, a striking individual or "classical" specimen of some group, with which all other cases are to be squared, "regardless of the fact that nature never makes two leaves on the same tree alike." Thus in the case of epilepsy, there are many forms of motor spasm, apart from the classical fit with loss of consciousness, and many of these are associated with other affections, *e.g.*, syphilis, tubercle, gout and the psychoneuroses. The skin, in particular, is a most effective pivot for the classification of diseases in general, as being the essential *fundamentum divisionis* in Huxley's classification of races of men and as being associated with four of the main diatheses, *viz.*, the syphilitic, tubercular, arthritic and dartsous (herpetic). Gouty, tubercular, luetic and serofulous patients have complexions all their own, as well as specific cutaneous eruptions. Advancing a step further, Allbutt points out that life itself is to the physician a series of physiological processes, of which serofula, rheumatism, periods of good health, syphilis, tubercle, rickets, etc., may be regarded as phases or "modes of growth." Such morbid states as bronchitis, meningitis, lichen, eczema, cardiac or renal disease are usually members or terms of such series, although commonly diagnosed and treated in practice as independent, self-limited diseases. Viewed from the Coan or Hippocratic angle, eczema is not a disease but "a member of a series having terms preceding and succeeding." Viewed from the Cnidian angle, it is a genus comprising several species, "each of which has its place in its own series." Eczema may have its stages of pityriasis, psoriasis or lichen, but eczema arthriticum or eczema diabeticorum are truer expressions of classification than eczema erythematosum or lichenoid eczema, which are merely superficial transient phases. The merit of Willan's classification of skin diseases is that he did not conceive of an elementary lesion, *e.g.*, lichen, as a separate, individualized disorder. In this connection, Allbutt cites the dictum of Hebra: "We are at present in the A B C of dermatology and must learn to read the skin."⁵ So the semeiology of the eye with reference to internal disorders has been interpreted by Schmidt-Rimpler or de Schweinitz. Furthermore the serial relation of diseases, like the differentiation of proteins with reference to their constituent amino-acids, applies not only to the individual but also to his relatives. When Charcot said that the patient is "only an accident in the history of the disease," he implied that the series may include the patient's ascendants, descendants and collateral sibs. There is merit in the English view that "we are killed not so much by diseases as by diathesis." Schön-

⁵ For the semeiology of skin diseases in relation to internal disorders, see Sir J. Galloway, *Lancet*, London, 1921, I, 364-369.

lein's rheumatic purpura (*peliosis rheumatica* (1837), and Henoch's purpura with gastro-intestinal crises (1874) illustrate these correlations.

In 1888, Osler described an arthritic purpura, with gastro-intestinal crises, mucous hæmorrhages, albuminuria and sometimes fatal nephritis.⁶ In 1895, he described eleven cases of polymorphous visceral lesions (gastric, renal, pulmonary) pivoting around the multiform erythemas (œdema, urticaria, purpura), with arthritis and other joint lesions. In a later paper (1900),⁷ he stresses the futility of sharply separating angio-neurotic œdema from urticaria, voices the crying need for a "dermatological Linnæus" to straighten out the erythemas, and concludes that there is "a positive advantage in recognizing the affinities and the strong points of similarity in affections usually grouped as separate diseases."⁸ In 1923-4,⁹ Libman and Sacks described four cases of atypical verrucous endocarditis, involving all four valves, and showing such varied clinical phenomena as arthritis, mucous ulcers, pleuro-pneumonia, embolism, enlarged liver and spleen, glomerulonephritis, leukopenia, with erythematous and purpuric rashes, sometimes lupoid, sometimes of the nodular type found by Osler in subacute bacterial endocarditis. Again, the exanthematous fevers are specific infectious erythemas, with definite invasion and marked repercussion *via* the respiratory system, as well as renal, articular, cardiac, aural and nervous complications. The relations of herpes zoster with the specific infections, particularly varicella and encephalitis lethargica, are suggestive, as are the diathetic affinities of the visceral neuroses and their serial relations with the vagus and cutaneous nerves. In Allbutt's view, the rheumatic series includes purpura, urticaria, pemphigus, erythema, endocarditis, chorea, arthritis; the gouty series, dyspepsia, arthritis, phlebitis, arteritis, nephritis, angina pectoris, migraine, hypochondria, insanity, eczema, glycosuria, neuritis, bronchitis, hæmorrhoids, hæmophilia; the neurotic series (Charcot's neuropathic tree), insanity, chorea, eczema, pruritus, angina pectoris, gastralgia, asthma, sternutation, flatu-

⁶ Osler: New York M. J., 1888, XLVIII, 675-677.

⁷ Osler: Am. J. M. Sc., Phila., 1895, n. s., CX, 629-646.

⁸ Osler: Brit. J. Dermatol., Lond., 1900, XII, 207-245. Osler was evidently unaware of Allbutt's paper of 1867.

⁹ Libman and Sacks: Arch. Int. Med., Chicago, 1924, XXXIII, 701-737.

lence, catarrh, migraine and hysteria. He mentions a father and three children variously affected with cancer, lymphadenoma, pernicious anæmia and pseudo-hypertrophic paralysis. Where the serial relation exists or coexists in the same individual, the sympathetic-autonomic chain may be the locus of some of these transformations. The grouping of special families of bacteria as a finite series, with two extreme terms, *e.g.*, the paratyphoid-enteritidis or colon-typhoid group, the diphtheria group, the acid-fast group, fits in very well with the familial or serial aspect of diseases. The remote effects of syphilis and tuberculosis in family groups, *e.g.*, the nervous or endocrine manifestations, indicate the wide distribution of these major series in space and time. Hamer even regards the "catarrhal group of diseases," *viz.*, influenza, encephalitis lethargica, poliomyelitis and cerebro-spinal meningitis, as mere variants of the same virus, under special conditions of space and time. This is virtually Sydenham's view that a major infection may undergo a long periodic development over hundreds of years, with seasonal recurrences showing variations in semeiology of the most pronounced character. Changes in clinical manifestations of disease in space and time, including the decline in virulence of certain diseases like scarlatina, are susceptible of many explanations, the most plausible being Pasteur's doctrine of the change in virulence of microorganisms under different environmental conditions. Change in the relative susceptibility of people to disease is also of moment. The known antagonisms between certain diseases, *e.g.*, sarcoma *vs.* erysipelas or malarial fever *vs.* cancer, phthisis and neuro-syphilis are inexplicable but of great interest and therapeutic importance.

In the broader field of epidemiology, the varied and seemingly unrelated (protean) aspects of a major infection, as it crops out in different individuals in a family, camp, city, nation or continent, are the analogues of varying symptoms or groups of symptoms in the individual patient.

The prodromata of Spanish influenza in London, as interpreted by Crookshank,¹⁰ were, in August, 1917, odd cases of acidosis, apparent tuberculous meningitis, cases resembling Brill's disease, tubercular peritonitis or scurvy; in January, 1918, pseudo-

¹⁰ Crookshank: Proc. Roy. Soc. Med., Lond., 1920, XIII, Sect. Epidemiol., 170-172, 176-178.

typhoid cases (influenza of gastro-intestinal impact); in March-April, 1918, cases resembling encephalitis lethargica; in May, 1918, groups of virulent pneumonias recognized as influenzal by November. The major epidemic got in full swing about June-December, 1918, and during these months there were more cases than usual of Landry's paralysis, ascending and transverse myelitis, overlooked in the general furore about botulism and encephalitis lethargica. The vernal and autumnal prevalence of epidemic encephalitis and poliomyelitis respectively is also noteworthy. While not all these manifestations may have been influenzal, there were enough to demonstrate the protean aspects of the disease in different individuals under varying space-time relations. In Crookshank's reading, encephalitis lethargica is only one phase or member of the gigantic series "influenza," the early Latin records of which show unmistakable sequels of encephalitic type in the 15th, 16th, 17th and 18th centuries, comparable with the botulism, poliomyelitis, paralysis agitans, epidemic hiccough, etc., associated with the encephalitis of more recent date.

The doctrine of serial relationships in disease is of purely scientific interest and has little, as yet, to do with the actual practice of medicine. It implies, to start with, such a control of data concerning the familial and hereditary relations of diseases as was only possible to the family doctor of the past, and is now set off by recent books on the constitution, studies of notable families and the like. Its importance to the practitioner lies in the fact that our current "clinical entities" are merely fictitious adventures in conceptual shorthand, which, as Cnidians, we are compelled to use in practice as labor-saving devices, but which, like other phrases and symbols, should never deceive us as to ultimate reality. The following excerpts from Allbutt's three essays on classification¹¹ may be helpful:

"When we classify a disease, we do so, not to group together affections having a community of site or of aspect, nor for easy reference, nor for the symmetry of a page or volume, but to express thereby the greatest possible number of facts concerning its relations with other diseases."

¹¹ Allbutt: St. George's Hosp. Repts., Lond., 1867, II, 187-204. Brit. M. J., Lond., 1888, II, 285-292. Guy's Hosp. Gaz., Lond., 1906, n. s., XX, 448-455.

“False classifications do mischief, not only in asserting what is false, in declaring a kinship where no kinship exists, but also in drawing the mind away from the perception of real affinities. We are by them led to think of diseases as isolated disturbances in a healthy body, not as the phases of certain periods of bodily development.”

“It is steadily forgotten that health is a diathesis as much as is scrofula or syphilis, and that each of these is a mode of growth. Some of these modes are more useful, others are less useful; but all tend, if unchecked, to pass through certain calculable cycles. That particular cycle which we call ‘health’ we prefer as being the most useful variety of the human plant, as it is the most varied and complex: for this reason we take it as a standard.”

“An insight into what South called ‘the fatal imposture and force of words’ may be received from that profound reverence for names which we observe in children—including grown-up children—in contemporary savages, and in folklore. An inquiring child is dissatisfied until he is told the name of a thing; savage man still believes that to get at the name of a person is to gain a power over him. To know the name was to have the kind of power which was obtained in the effigy, the power vicariously to injure the person. Thus persons or gods would take false names in order that the real name might be sheltered from malevolence, or that the worshipper might be spared the fulmination of the name.”

“In mediæval times so fastidious were logic and abstraction that practice became a vulgarity, and he was the greatest teacher who carried his pupils farthest from things.”

“Unfortunately we go on building with names when the things are altered or wasted away, as sometimes beavers pathetically persist in constructing dams and canals when the water has gradually dried up, or has changed its course. If we realize how a word may survive to oppress and mislead us, as other ghosts do, when the underlying thing has dissolved, we shall be more careful in setting up imposing names, as we physicians are very prone to do, until we are sure that the thing is there; and in no case shall we let a name give an absolute value to temporary or developing notions.”

“Some of you who have heard my teaching before must forgive me if I repeat my insistence that the name of a disease is not, as it is continually regarded, a thing. There is no such thing as typhoid fever, as angina pectoris, as spleno-medullary leukaemia, and so forth; the things so called are Wilkinson, Johnson, and Thompson, who after their kinds are afflicted not alike, but within such limits of similarity as to lead us to class them together and to form a general conception of them. And yet still we overhear at learned societies physicians, whose shoe-latchets I am not worthy to unloose, contending, even with heat, whether this name or that is a ‘morbid entity.’ ”

“If we are to speak of ‘entities’ in disease, these must be not the names, nor even our concepts, but the things—the thing Thompson and the thing Wilkinson in certain phases of their being. The moment we depart from these objects we desert the names of things for the names of abstractions in which no entity can lie, the name being but a label to denote a somewhat arbitrary and ideal group of characters never perhaps manifested in nature as a whole, but to which certain patients are continually approximating. I do not pretend for a moment that we can do without abstractions; without them reasoning would be impossible: our safety lies not in avoiding reason but in being quick to recognize the tendency of ratiocination to carry us away from the only pregnant subjects of reason—namely, from things, with which reason should habitually and steadily concern itself.”

“Diseases are not even species, such as cats and toads, but abnormal, though not altogether irregular behaviors of animals and plants. Once more; not content with this ambiguity we entertain the converse notion also that, give it a name big enough, we can make a disease of a symptom. For example, bradycardia and tachycardia, symptoms, in their degrees, of many a morbid process, impose upon the unwary student as themselves ‘morbid entities,’ a notion twice removed from the truth.”

“The pathologist has seduced us into allowing him to use the label of arteriosclerosis as the name of a disease. Now, if for the physician a disease is a series of symptoms recurring with such uniformity that we think it convenient to distinguish it with a name, arteriosclerosis is not such a series; it is not a series of symptoms at all; it is a result, a statical result, of foregone

symptoms, probably of more than one series, and, if so, probably itself a compound name even in pathology. The physician who recognizes the imperative duty of dwelling in things ought to guard himself from being supposed to mean only things that stand still; his sphere is, on the contrary, with things in motion—he is a master of dynamics.”

“Mr. Galton, Dr. Isambard Owen, and Dr. Billings tell me that when we desire something more than the notes of the family history of the same disease, when he ask for a scheme of all the diseases, fatal and non-fatal, found in one family, we desire that which does not exist. The only persons indeed who could make adequate records of this kind are family medical advisers who have watched over the same households for long periods of time. Public opinion is not yet alive to the importance of such records, and as busy doctors decline in years, they are less willing to embody the invaluable results of their experience. Thus a synopsis of all the maladies current in one family tree is rarely or never met with; although we admit that the individual is but one link in a chain.”

“Much of the work which is done in our laboratories and dignified, not improperly perhaps, with the title of research, much plotting of curves, much watching of levers and thermometers, nay, not a little morphological dissection and cabinet making, are really little more than clerk’s work. To be no more learned in facts and opinions, with whatsoever skill in methods, is not to make knowledge. Bundles and files of facts are not science until the man with the formative, let me say the creative, insight comes along, who by the fusion of intellect and imagination seizes upon the significant facts, which give him the lines on which to build up these aggregates of materials into a conceptual edifice. As we abstract we depart from things; and the wider the successive abstractions, the farther we are leaving things behind, the more and more are we eliminating those contingencies in which processes, organic and inorganic, essentially consist.”

“The laboratory, invaluable, essential as its work is generally speaking, is apt to dwell only half in things; and nature will have no half loves. It is in the full commerce of nature and men that the problems fruitful of science arise; their events and processes, vulgar as they may be, are full of the unexpected, and

it is beyond the imagination of any scientist even to conceive such combinations and emergencies unless he is conversant with things. Furthermore, if he tried never so generously to imitate natural processes and events on his artificial platform, he could not possibly reproduce them in their complexities. The navigator of models in a tank would cut a poor figure as captain of a man-of-war in the Atlantic. Thus, without periodical steeping in the world of practice, theoretical researches tend to remoteness and vacuity. It is by continual touch with Mother Nature that we renew our strength, and for her nothing is common or unclean."

"Day by day we see well-meaning men confusing themselves and others by ignoring that in science law is not a rule imposed from without, but an expression of an intrinsic process. The laws of the lawgiver are impotent beside the laws of human nature, as to his disillusion many a lawgiver has discovered."

"To find new arms against disease, we must have a truer conception than we mostly have of the genesis of disease. No mere enumeration of symptoms or of pathological detail will suffice for this, nor even a full description of diseases severally. We have to work out the genetic affinities of diseases, their origins, parent stems, and alliances, as well as their issues. We can have no complete therapeutics until the science of comparative nosology is in great measure constructed—a science as yet scarcely begun—nay, as yet scarcely recognized."

"Medicine likewise, because it deals with things, has always been for our serenest circles, a Cinderella, blooming maid as happily she has grown nevertheless."

The conclusion of the whole matter is implicit in Osler's dictum—"Treat the patient rather than the disease"—and, for neurology particularly, in the line of Weir Mitchell:

" 'Tis not the body but the man is ill."

F. H. GARRISON

OBSERVATIONS DURING THE PERIOD OF UNDER- NUTRITION IN GERMANY

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(Delivered before The New York Academy of Medicine, October 21st, 1926)

I appreciate most deeply the kind invitation of The New York Academy of Medicine and I did not hesitate a moment in accepting it because I wish to do my best in promoting good understanding between the medical men of the United States and of Germany.

I propose to review the years of undernutrition suffered by the German people during the times of the blockade and revolution and to look on this period not from a political but from a medical standpoint as one would view a great experiment from which we may try to draw some conclusions.

From the very beginning of the war we realized that the available food supply would not be sufficient for the German population because statistics had shown that during the years of peace it was necessary to import many million tons of food for man and cattle and large amounts of fertilizers for the fields. How could the country stand a period of total blockade like a fortress surrounded by enemies on all sides? We therefore were not astonished when we realized early in the Fall of 1914 that the bread supply was insufficient. It was possible to meet this difficulty in two ways. The first was a legally enforced distribution of the entire bread supply to the whole population by means of the bread cards. The second method was a greater utilization of the wheat taken for bread.

The first of these two ways proved beneficial and it was soon necessary to extend the card system with fixed prices to the distribution of meat, milk, eggs, fat, potatoes, and finally to nearly every food-stuff. One may regard a legal distribution of food as a socialistic method but it is necessary to prevent the rich from leading an opulent life while the poor starve as they really did in Constantinople and Vienna. Of course such an enforced restriction and distribution is possible only in a state with strong government and good civil order. With the breakdown of the social order during the revolution of 1918 the regular food supply collapsed and a wild illegal struggle for food began.

The second method of regulation, coarser milling, was of doubtful value. In times of peace the rye and wheat were normally milled so that 60 per cent. was utilized for bread. With the new law it became obligatory to use 95 per cent. so that the bread contained all the bran and this was not digestible for man. This same bran, however, is digestible for the cow and the cow can produce milk from it. Milk almost disappeared from the cities and could only be supplied to infants and sick people. Bread became worse and worse, especially in 1916 when potatoes and turnips were mixed with the whole wheat. The question of the bread was all the more important because, on account of the lack of animal food, bread supplied almost two-thirds of the necessary food calories.

Of all the restrictions the deficiency of *meat* was the least important and produced no bad results. Hyperloyal physicians and men like Ragnar, Berg and Hindhede insisted emphatically that a vegetarian diet would be of the greatest benefit to the population, but more critical observers were not able to see the promised benefits from the lack of meat—with one exception. *Gout* disappeared entirely and in fully developed cases of gout the affected joints showed distinct improvement. Among the population in general the amount of uric acid in urine and blood fell to half of the normal level, not lower. It reached the level of the endogenous uric acid.

Is it not curious that the human body even in restricted diet is able to build up the complicated nucleinic substances while it is absolutely unable to destroy uric acid? Not all of the chemical reactions in the body are reversible.

After the experience of the war there is no more doubt that the development of gouty affections (I do not say the origin of gouty *constitution*), is to a great part dependent on rich food and alcoholic drinks.

The triumph of the vegetarian apostles like Hindhede did not last very long. Soon after the war the whole population forgot the benefactions of the vegetarian diet and eagerly went back to meat—and two years afterward some cases of gout reappeared.

With few exceptions the restriction of diet did not show really bad effects until the Fall of 1916. We all became thinner and

the average weight diminished about 12 per cent. Stout people and heavy eaters lost far more than people of normal shape and it was not rare for the obese to lose 70 to 90 pounds. Real obesity was no more to be seen on the streets and the experience of this period of undernutrition has clearly shown that common obesity is not so much caused by endocrine and constitutional disorders but to a simple discrepancy between food intake and expenditure. The basal metabolism of obese people is not lower than in the individuals of normal shape, but very often a little higher.

Things went on very tolerably until the Fall of 1916. About this period milk disappeared almost completely, cheese, butter and eggs became scarce, bread hardly more deserved its name and worst of all the harvest of potatoes in this year was very bad. Instead of potatoes we were obliged to eat indigestible turnips for breakfast, lunch and supper. The tragedy began. Previously the loss of weight had been due to a diminution of the fat stores but now appeared a wasting of the muscles, and with it came a loss of strength. Exertion grew more and more difficult. In my trips to the numerous hospitals in the field and at home I found it difficult to climb the staircase of railway stations. In the factories they needed three men to accomplish the same work formerly performed by two. Even the children lost the desire to play. In the civil prisons the criminals became so weak that they could no longer work and in the insane asylums patients who formerly were excited remained quiet and stayed all day long in bed since this was the only place they could be warm. The body-temperature was below 96.8° F. and the pulse rate sank from 50 to 40. Even among the population in general, the systolic blood pressure fell to 100 and lower. In addition to the bodily emaciation came a mental exhaustion, depression and irritability, and a large part of the subsequent moral breakdown was due to this state of mind. There was forced upon our notice a mysterious increase in the death rate, particularly among old people. Almshouses and asylums were slowly emptied by the increased mortality and in these houses we first saw the cases of edema. This edematous swelling of face, limbs and body slowly manifested itself among the free populations of the cities also.

In order to explain these problems, experiments were made in many places including our own clinic. Dr. Jansen and I made some observations on the inmates of asylums and prisons and also on some students of medicine in our clinic. All of these persons were put on the diet as prescribed by the legal distribution. First it was necessary to find out the real caloric value of the ration since it would be wrong to estimate its value from the analytical tables used in times of peace. We collected and dried the food for the whole day and analyzed a sample by combustion in a Berthelot bomb. From the caloric value of the food it was necessary to subtract the caloric value of the feces. This examination made it evident that the real caloric value of the diet was not 1,350 calories as officially given, but only 1,100 to 960 calories on account of the large proportion of unabsorbable material. A nutritive value of 1,100 to 960 calories is of course far less than is necessary to maintain the needs of the body. It is even lower than the resting basal metabolism while for light work 2,300 calories at least are necessary. But our subjects were *obliged* to perform some work and muscular work cannot be produced more economically than its real caloric value. And in addition we had to work harder than during the times of peace. It was therefore evident that people on this diet must lose weight and body substance. Examination of the nitrogen content of the *food* showed that the amount of protein in the diet was sufficient and even much higher than the nitrogen minimum of 3 to 4 grams a day, but the nitrogen *excretion* by urine and feces was found even higher than the intake since the sparing effect of the carbohydrates and fats were insufficient.

I cannot understand how Johansson in his latest article could deny the sparing effect of carbohydrates and fats upon the protein metabolism. Did he not realize that this sparing effect is only manifest in cases of *deficiency* and not in cases where carbohydrate is added to a diet that is already sufficient? The negative nitrogen balance in our cases was therefore caused by a deficiency of fat and carbohydrate in the food and as soon as we gave our subjects additional fat or sugar, the nitrogen equilibrium was reestablished and there was even some nitrogen retention.

A determination of the basal metabolism by Zuntz and Loewy and by ourselves made it evident that the basal metabolism was

distinctly diminished in comparison with the metabolism in time of peace and even reduced in a higher degree than the loss of body weight. While the body weight was diminished on the average 10 per cent. the diminution of basal metabolism amounted to from 12 to 15 per cent. These results agree with those of Benedict obtained with his students in the condition of prolonged undernutrition. It was evident that an economical *adaptation* had taken place at a lower nutritive level. In consequence there was a reduction of body temperature, pulse rate and blood pressure and the vitality of other organs with a resulting diminution of mental and bodily efficiency and a diminished resistance against disease. Tuberculosis ran a more malignant course and a frightfully increased mortality,—about 50 to 90%. Pneumonia and other infectious diseases and surgical operations showed a diminished tendency towards recovery.

During the early part of the war some optimistic physicians had published the opinion that the German people had been overfed and that a reduction of food was not only allowable but also beneficial. But when the real diminution in food took place it became clear that it was not a benefit but a menace.

This diminution of the basal metabolism during prolonged undernutrition finds its antithesis in the *increased* metabolism during periods of overabundant feeding. Grafe uses the expression of "Luxuskonsumption," a conception stoutly denied by Karl Voit, Rubner and my former assistant Lauter. It is evident that every increase in the oxidative processes which is not used for muscular work must find its expression in an increased production of heat (I do not say in an increased body temperature). In fact a well-nourished man can bear cold temperatures much easier than a starving man who can scarcely warm himself while in bed, and an overnourished man or animal may even find difficulty in getting rid of his overproduction of heat. But is it really a luxury when the state of nutrition of the body is improved (naturally only to a certain degree) and as a result the resistance against certain diseases is increased? Thus it was possible for me many years ago to show that during the recovery from severe infectious diseases like typhoid fever the basal metabolism was distinctly raised in accordance with the increased

appetite of the patients, and we employ abundant feeding for the curing of tuberculosis. The question of the increased basal metabolism in overnutrition stands in close connection with the specific dynamic action of Rubner and the law of Lavoisier's that the metabolism is increased after the taking of food. The specific dynamic action is only a special case of the general law that food raises and starvation diminishes the production of energy. Rubner has shown that this production of extra energy after taking food cannot be used for the production of muscular work and therefore we may conclude that it does not take place in the muscles but somewhere else, possibly in the liver. Among the different food-stuffs protein produces the most energetic rise in heat production. These are the facts and the only question is how we shall explain the phenomena.

There are three possible ways to explain them. The first and simplest method of explanation is that the human body behaves like a stove and that the more fuel you put in the more is burned, and in consequence the more heat is produced.

The second theory is that food and especially protein act as a stimulus, and Graham Lusk has shown that especially some amino-acids like glycocoll and alanin increase heat production while other amino-acids do not. According to Lusk's work the amino-acids which produce extra heat are nearly the same as those which can be transformed into sugar.

The third way of explanation is that the increase of heat production is due to the work of the intermediary chemical transformations. Thus the transformation of sugar into fat or protein into sugar needs energy and thereby heat may be set free. Included in the work of this intermediary metabolism is the production of hydrochloric acid in the stomach and the work of all the other digestive glands, and I think that they need a lot of energy. I am inclined to propose this last theory. The specific dynamic action is not constant but it is variable and changes not only with the different kinds of food-stuffs but also with the general state of nutrition and especially in connection with the glycogen content of the liver.

The question of overfeeding has been the subject of excellent work by Lusk, who was able to show that in hogs, during a tre-

mendous overfeeding with carbohydrates, a considerable increase of oxidation takes place, the metabolism being increased 100 per cent. above the former basal metabolism, this increase lasting not only twenty-four hours but also during the whole period of overfeeding. But the greater part of the carbohydrate in the food was transformed into fat and deposited in this form in the tissues. The respiratory quotient was increased up to 1.5, although it is only 1.0 during combustion of fat.

The great excess of oxygen output over the intake can only be explained by the transformation of a great amount of carbohydrate into fat, since the molecule of carbohydrate is far more rich in oxygen than that of fat. The enormous increase in the oxidative process may be explained by the assumption that the transformation of carbohydrate into fat requires energy, and the production of this energy proceeds with increased heat production. I therefore believe that the increase in heat production by constant overfeeding can well be compared with the temporary increase of metabolism, caused by the specific dynamic action of foods and that both processes can be explained by an increase in the intermediate chemical work required.

The fourth possibility is put forward by Johansson of Stockholm. A few months ago he published some new ideas about the metabolic processes,—some ideas which may change or alter our previous conceptions. Upon the basis of the researches of Meyerhof and Hill, Johansson has established a theory that the consumption of energy does not take place during the active work of muscles and glands but during the period of *recuperation*—"first the work, secondarily the consumption of energy."

May I make a comparison? Energy is used not in firing the gun but when it is reloaded; not in shooting an arrow, but in drawing the bow. Hill has indeed shown in his splendid experiments that energy consumption, measured in terms of heat exchange, takes place not only during the contraction of the muscle but also—although to a lesser degree—for a certain time afterwards during the period of recovery, and he has shown that this period of recovery is accompanied by an increased consumption of oxygen, which is to say by oxidation.

But I do not believe that it is permissible to draw from this experiment the conclusion that the whole consumption of energy and the whole production of heat fall in fact in the period of recovery, as Johansson wishes to say.

Hill accepts the view of Meyerhof in proposing the theory that during the period of work the glycogen of the muscles is converted into lactic acid and that during the period of recovery the lactic acid is converted back into glycogen. This endothermic reconversion of lactic acid into glycogen requires energy and takes place with consumption of oxygen, but the process takes place without the entrance of oxygen into the molecule, since the relationship between oxygen, carbon, and hydrogen is the same in lactic acid as in glycogen.

The consumption of oxygen and energy must therefore be the consequence of oxidation of other substances. Meyerhof and Hill assume that a part of the lactic acid, either one-fifth or one-fourth, is burned to carbonic acid and water, to provide the energy for the resynthesis of the glycogen, and recently Meyerhof has stated that this energy may be produced also by oxidation of fat.

Indeed Zuntz has shown that during a state of glycogen deficiency, work can be produced by oxidation of fat alone, and Lusk has shown in brilliant experiments that in this condition the respiratory quotient is so low as to indicate that the energy production takes place from combustion of fat. Moreover Krogh has shown that the production of energy takes place in a more economical way when carbohydrate is burned than when fat is consumed.

Meyerhof, Hill, and Johansson assume that during work glycogen is transformed into lactic acid, and that during the period of recovery this lactic acid is reconverted into glycogen, only one-fifth or one-fourth of the lactic acid being burned. Within this theory is hidden a little of perpetual motion, and when we assume perpetual motion we are always wrong.

Our acceptance of this theory meets with some difficulties.

First, the oxidation of lactic acid is not so easy as that of the aldehydes, such as methyl glyoxal, glycerol aldehyde, or acetaldehyde.

Secondly, according to this theory we must conclude that an enormous amount of lactic acid is produced in the muscles during hard work. Lusk has calculated that during hard work a man may liberate not less than half a kilo of lactic acid per hour, and in seven hours of hard work might liberate the enormous quantity of 3.5 kilos of lactic acid. Of this amount four-fifths would be resynthesized into glycogen.

Third, Hill himself states that "in a muscle kept in oxygen, no lactic acid ever appears." Lactic acid appears in muscle preparations only when contractions occur in an atmosphere free from oxygen. Lactic acid is therefore found only in the absence of oxygen.

I believe, therefore, that the older assumptions are not yet disproved. The older theory was that the energy of muscular work is produced by direct combustion of glycogen and sugar, with the intermediate products of easily combustible materials such as pyruvic acid, methyl glyoxal, and acetic aldehyde, and that this energy can also be produced by the combustion of fat.

I do not care much which of these theories is right. The facts are established and the experiences during the period of undernutrition have clearly shown that our views about the energy metabolism are right and that they fully agree with the law of the conservation of energy.

After consideration of the *quantitative* metabolism let us turn to the *qualitative* and *pathological* changes seen in men during the period of undernutrition. The most important symptom was the hunger edema with its pale, swollen and mask-like face. One could believe that this pale color was due to a severe degree of anemia, and examination of the blood showed that the red blood cell count was somewhat low but this apparent diminution of the red blood corpuscles was due to a hydremic condition and not to a severe reduction of the red blood cells. The blood serum was indeed very rich in water and the protein content was extremely low, even down to half of the normal rate. The amounts of calcium and lipid bodies were distinctly lowered. The sugar content varied between very low and nearly normal. On the other hand the sodium chloride was extremely high, even up to 0.8 per cent. We can explain this phenomenon by Donnan's law which states that the content of salts must rise in body fluids when there is a diminution in the protein and other colloid materials. This is necessary in order to maintain the normal osmotic equilibrium. The body tissues as well as the blood serum were overfilled by a fluid which approached the composition of normal physiological salt solution. We can therefore understand the abnormal craving of the patients for salt in the food. With this

the excretion of sodium chloride in the urine increased to as much as 40 grams a day and more. It was evident that the function of the kidney was normal and that the edema was not due to an insufficiency of the renal function but was of extra-renal origin. We may ask if it was the low content of protein in the blood serum which caused the transudation of salt solution into the tissues or if it was the diminution of the calcium and especially the lipid substances which led to an abnormal permeability of the walls of the blood vessels.

It was interesting to see that the content of hemoglobin in the red blood corpuscles was not diminished but was increased and the color index rose far above 1 and even as high as 1.9. In stained blood smears the red corpuscles showed an appearance similar to that found in pernicious anemia. But this high color index had nothing to do with pernicious anemia and it is evident that we may conclude from this that the high color index is not the essential characteristic of pernicious anemia, but that in this disease other factors are of greater importance.

We have seen that even in severe cases of hunger edema no real anemia was present and as a matter of fact during this period we saw no cases of chlorosis. We can conclude that even during a time of serious lack of food the synthesis of the complicated hemoglobin molecule takes place without difficulty. Apparently living organisms from the yeast cells up through the whole series of animals find no difficulty in producing the complicated nitrogen-containing ring of the substituted pyrrol molecule and from simple open chains combine the coloring matters of porphyrine, chlorophyl and hemoglobin. How extraordinary that the body is not able to break down the once established hematine farther than bile pigment! Therefore here as in the case of the purine metabolism we have an irreversible reaction. My former assistant, Prof. Hans Fischer, in the last few months has had the good fortune to be able to prepare synthetically hematoporphyrine and he pointed out that the production of hemoglobin by animals and man by far exceeds in amount the artificial production of all the paints and dyes of industry.

During the second half of 1917 hunger edema disappeared in a relatively short time. This was the result of a good harvest of

potatoes and these potatoes allowed us to give once more sufficient calories. Potatoes indeed saved the German population from the extremes of starvation.

When a patient with the hunger edema really began to improve there was a tremendous increase in the output of urine. With this came an excretion of as much as 160 grams of sodium chloride in a few days and a rapid loss of weight. In cases where we were able to give abundant food again we saw to our astonishment that the patient did not increase in weight. But we must not forget that he had to replace the water in his tissues with fat and that a kilo of water is as heavy as a kilo of fat and that the same volume of fat tissue is not nearly as heavy as the same volume of salt solution. Therefore the weight of a person is a most uncertain indicator of his state of nutrition.

When we saw the first cases of edema we believed that it was a manifestation of avitaminosis. However the well-established types of avitaminosis did not appear. We never saw diseases like beri-beri or scurvy because we had plenty of potatoes, turnips and other vegetables. But in Asia a part of the English army surrounded by Turkish troops and cut off from all fresh food suffered from a severe outbreak of scurvy.

Are we really to consider hunger edema as a symptom of avitaminosis? This makes it necessary to define what we mean by vitamins.

The characteristic signs of avitaminosis are:—

1. A diminution of fertility.
2. A retardation of development and especially of the growth of young animals and children.
3. Symptoms of malnutrition and disease in the fully developed adults.

Diminished fertility was indeed one of the characteristic symptoms during the period of inanition. The official register showed that the birth rate had diminished enormously, falling to half the figure of the rate before the war. Abortions became frequent, in many young women menstruation ceased and in men there was a marked diminution in the libido. We can see therefore that there was a distinct diminution in the function of the gonads. Zahn has shown by his official statistics that during the war the

diminution in the number of births amounted to the same low figure as if for one whole year there had been no births in Germany.

The worst part of this whole affair was that we looked upon this not as a calamity but as a blessing because we were sure that we would not have either enough food or enough work to maintain them. It is a regulation of nature that in times of want the number of individuals decreases.

But one question. Is the diminution of fertility a characteristic and pathognomonic sign of avitaminosis? I think not.

Professor Stieve in Halle has shown in his experiments on mice, rats and geese that not only inanition but more so overfeeding and obesity checks fertility in both male and female, and brings about severe atrophy of the gonads. Furthermore he could demonstrate that fear, confinement and other severe *mental* influences damaged materially the power of fertility and produced an atrophy of the gonads as demonstrated by the microscope. Therefore we may conclude that the diminution of the birth rate is not a characteristic sign of avitaminosis.

Next we shall consider our second point, the development of children. During the war the increase in weight of children fell off markedly, in Munich 4 per cent., in some other cities as much as 12 per cent. The growth in height was only slightly diminished, $\frac{3}{4}$ of one per cent. on the average and according to some reports not at all affected.

There was indeed some extension of rickets among the children, especially in Vienna and some other large cities, and during the years of adolescence coxa vara with its characteristic pain became frequent. Older people and hunchbacks complained of pains in the back, X-rays showed slight osteomalacia and kyphosis became worse. Treatment with phosphorus and cod-liver oil brought distinct improvement.

The "Wachstumstrieb," the *impulse* for growth therefore was *not* diminished. The observation of the fact that the affections of the bones improved distinctly after the administration of cod-liver oil could be explained as a symptom of avitaminosis due to deficiency of vitamine A. We must remember that vitamine A is not equivalent to "Wachstumsreiz," the stimulant of growth, but

that this vitamine A is a necessary complement to bring about growth. When there is no stimulus, vitamine A cannot produce growth but growth can be checked by a deficiency of vitamine. The mysterious "Wachstumstrieb," the stimulus for growth is more dependent on the glands of internal secretion like hypophysis, thymus and thyroid gland but it can only act with the help of the vitamines.

Among the vitamines which are necessary for growth vitamine A seems to be the most important. A. F. Hess has shown, and some German investigators have corroborated, that vitamine A does not belong to the phosphatids like lecithin but that it is related to cholesterole and arises from this substance under the influence of light. Windhaus has established the chemical formula of cholesterine. The alcoholic group is the place where it can combine with fatty acids to form esters. We may assume that the double binding is the place where light acts and produces some oxidation. This vitamine is therefore no longer a mysterious body and this helps us perhaps to have a better understanding of the nature of the vitamines in general.

Would it not be possible to characterize the vitamines as all those substances which are necessary for growth and maintenance of health which cannot be produced by the organism itself but must be supplied from outside? I should like to support the old view of Liebig that the soil needs at least a certain minimum of every single substance necessary for the growth of the plant. In the same way it holds true in the animal body that growth is only possible with a minimum of iodine and Halsted has shown that growth is checked when there is no iodine in the food. I therefore conclude that iodine is a vitamine, like calcium, magnesium and iron. Of course growth is not possible without protein but it is not protein itself which is necessary but the single amino-acids. It has been proved that growth is impossible without lysine and the establishment of nitrogen equilibrium and the prevention of death is possible only with a mixture of amino-acids which contains cystine and tryptophane.

Now we come to the question as to whether cholesterole can be formed in the body or if it must be given in the food. Thannhauser has shown in his experiments that the excretion of chole-

terine in urine and feces is nearly the same as the intake in the food. But should we not include in this balance between intake and output the bile acids also, the chemical formula of which is so closely related to that of cholesterole, that we must conclude a common origin? The production of bile acids for twenty-four hours amounts in the dog to one or two grams while the cholesterole in the food is not more than a few milligrams. We may therefore conclude that the complicated formula of cholesterole and bile acids may be combined in the body and Windhaus believes they are built up from the straight chain of oleinic acid.

Pirquet and other authors have assumed that the phosphorus-containing lipoids like lecithin are not among the vitamins, but that they can be produced by the body itself. I am not perfectly sure of it. Why then does the yolk of the hen's egg and of all other eggs contain so large an amount of phosphoric lipoids? It seems to me that they are necessary for the building up of the embryo. On the other hand it is of interest that in the egg neither pyrrol nor purine bodies are present although during the development of the chick within the shell a great amount of blood pigment and nucleinic substances are formed. It is evident that pyrrol and purines do not belong to the vitamin group.

With the end of the war we hoped that the blockade would end and that food supplies would come in again to the starved population. But the blockade continued. The deprivation of food became extreme, the mental state of the population broke down, all bonds of order collapsed and the revolution broke out, with the slogan of "more food, at lower prices, and shorter hours of work." In this worst period of our country the work of charity from America set in and we never will forget our thanks for this help of charity given to the starving German population, by our American friends, especially by the Quakers and last, but not least, by the American physicians.

Gentlemen: I have tried to draw a sad picture of the starvation which the German population suffered during the war. War is bad, it brings enormous sufferings and losses of life and happiness, it disturbs the mind and evokes cruelty. But war is able to bring forward the greatest mobilization of energy, self-denial and sacrifice.

Revolution is worse, it loosens all bonds of authority and releases the lowest instincts in the worst classes of the population. The gain is small and the loss of culture great. The recovery from the false ideas is slow, very slow.

I sincerely hope that your beautiful, rich and highly cultivated country will never undergo the horror of revolution which is the most cruel of all kinds of war.

Abstracts of papers presented before the Section of Genito-Urinary Surgery, March 17th and May 21st, 1926

(a) URIC ACID AND URATIC STONES IN THE KIDNEY;
URIC ACID SHOWERS AND DIAGNOSIS

EDWIN BEER

One of the most serious pitfalls in diagnosis encountered by surgeons, internists and radiologists is in the recognition of uric acid stones and the clinical pictures induced by such stones or by showers of uric acid crystals. The clinical pictures presented by the above conditions have interested us for a number of years. Originally, it was recognized that stones of this composition caused no shadow on the X-ray plate, and the report of a negative radiogram was recognized as of but little value. With the introduction of the Bucky diaphragm these uratic stones in the bladder were more regularly caught on the film though the shadow, at best, was only faint. In the upper urinary tract, the analysis of stones passed showed that in this vicinity about eleven (11%) per cent. of the stones were composed of uratic salts and uric acid. These the X-ray regularly failed to show despite the use of the Bucky diaphragm.

In a series of six cases presented at this meeting, it was shown that the diagnosis of the presence of uric acid calculi in the kidney pelvis could be made by combining pyelography and the passage of wax bougies. These stones in the kidney pelvis at times attained large size, and in the pyelogram showed their presence by a well-marked filling defect. Very frequently in

these cases, the wax bougie will obtain a positive scratch-mark. It is possible that many patients who have more or less typical kidney colics, whose X-rays are negative, may harbor such translucent uric acid stones in their kidneys and, unless they are carefully and repeatedly studied, the diagnosis of the exact condition may remain obscured.

Closely related to this group of patients with sizable calculi in the kidney, there is a still larger group of patients who suffer from typical colics caused by the passage of showers of uric acid crystals. The voided specimen when fresh rarely shows the presence of these crystalline substances but on standing, with the separation of the colloidal nebecula, crystals drop out. This phenomenon is present in many cases that never complain of urinary symptoms, but when it is present in patients with typical unilateral or bilateral kidney colics and when, moreover, diminution in protein intake is followed by a relief of all symptoms and the disappearance of the crystals from the standing urine, it is only fair to assume a definite relationship between complaint and appearance of uric acid crystals. What probably happens in these cases is a precipitation of crystals in the upper tract and as the colloidal solubility is re-established (reversible colloid), the uric acid goes into solution again so that in the voided specimen there is no evidence, as a rule, of the presence of these crystals.

How often these cases are misinterpreted—perhaps interpreted as kinks of the ureter, strictures of the ureter, perinephridies, and the like—it is difficult to say.

(b) THE CURVE OF 'PHTHALEIN EXCRETION; ITS INTERPRETATION AND CLINICAL USE

A. J. CROWELL

Charlotte, N. C.

The dye test for kidney function as usually employed does not tell the entire story. While the 'phthalein output and blood nitrogen are the usual renal function tests used as guides to operability of prostatic cases, there have been observed distinct

discrepancies between the information obtained by these methods and eventual clinical outcome.

Shaw has pointed out some characteristics of the plotted curve of dye excretion which give additional information of great value in choosing the time of operation and in offering a prognosis. Repeated clinical test of this method in 100 cases has confirmed his findings and convinced us of its usefulness.

Characteristics of the type curves, with actual case curves.

Case reports of simple and complicated prostatic cases with repeated dye curves which aid in guiding the management of these cases.

(c) THE ROLE OF A SPECIFIC BACTERIUM IN THE PRODUCTION OF URINARY CALCULI

B. H. HAGER and T. B. MAGATH

In a previous publication attention was called to a specific bacterium as the etiologic factor in production of incrustated cystitis with alkalin urine, and at the same time mention was made of the fact that free, floating stones of the bladder were occasionally observed in laboratory animals in which incrustated cystitis was experimentally produced. This particular species of bacteria had not previously been described, and it was placed in the genus *Salmonella*.

Twenty strains have been studied, and as a result it is believed that the organism does not belong in the genus *Salmonella*, because the majority of the strains liquefy gelatin, grow with ameboid colonies, and all appear to be protein destroyers. They have the characteristics of the genus *Proteus* except that they do not ferment sucrose. Since the fermentation of sucrose appears in the generic description of *Proteus*, it was proposed to modify the genus to include some forms that do not ferment sucrose. As this seems to be the most logical disposition of the species, the name becomes *Proteus ammoniae*, there being no other species corresponding to this.

From experimental work and a study of the cases of incrustated cystitis associated with alkalin urine, it seems that the presence

of *Proteus* organisms in the bladder is important. Whether any other member of the genus beside *Proteus ammoniae* can produce the pathologic picture made by this specific organism is not known. The facts are these: this organism was isolated in many cases of incrustated cystitis, and in all cases so clinically diagnosed since the identification was first made. No other organism of this genus was isolated in such cases, but other members of the genus *Proteus*, in cases other than incrustated cystitis, were occasionally isolated.

Because of the occurrence of true vesical calculi associated with alkaline urine and because of noting free, floating stones in the bladders of animals in which incrustated cystitis was produced, the authors sought to determine whether or not there existed any relationship between vesical calculi, found in alkaline urine, and the presence of *Proteus ammoniac*.

Four case histories of vesical calculi with alkaline urine from which *Proteus ammoniae* were isolated are presented.

(d) EXPERIMENTAL AND CLINICAL PROOF OF THE VALUE OF INTRAVENOUS GERMICIDAL INJECTIONS IN LOCAL AND GEN- ERAL INFECTIONS

H. H. YOUNG, Baltimore

J. H. HILL, Baltimore

Dr. Young traced briefly the history of intravenous therapy beginning with the first injections made by Sir Christopher Wrenn, the great architect of St. Paul's Cathedral in London. He showed that numerous great names in medical history have been associated with attempts to treat infectious diseases by intravenous drugs, culminating in Ehrlich's presentation of his salvarsan and claims of a *therapia sterilisans magna* in spirochetoses and spirilloses. Dr. Young gave in detail the work at the Brady Urological Institute in an effort to obtain a more effective, less toxic, less-irritating germicide, which culminated in the discovery of mercurochrome, which could be introduced into animals

and human beings intravenously in doses of 5 mg./kg. of body weight with impunity. The first work which had shown this drug to be of value in the treatment of wounds and inflammations of mucous surfaces had been extended to the intravenous treatment of general infections, septicemias, infectious diseases and local infections. He cited at first almost moribund cases in which septicemia was rapidly cured by intravenous injections of mercurochrome, described hundreds of other cases and infections of various types in which the drug had been employed. He presented detailed tabulations of over 600 cases with many extraordinary results in diseases which have heretofore been always fatal. In 173 cases of septicemia, 109 (63 per cent.) were cured. He cited 200 cases of pneumonia from the clinic of Freeman and Hoppe in which the mortality had been reduced from 35 to 10 per cent. He also showed tabulations of various other local and general injections—erysipelas, cellulitis, furunculosis, arthritis, pyelitis and various infectious diseases in which marked benefit was obtained by intravenous mercurochrome therapy. A summary of 611 cases of various types showed that 74 per cent. were cured or immediately improved. He quoted additional series from the clinic of Dr. Du Bose in which 100 cases were treated with only 5 deaths. An analysis made of urinary findings before and after mercurochrome showed that in 510 cases in which accurate information was at hand, only 11 showed more than transitory albuminuria or casts and 10 of these 11 cases were practically moribund and died within a few days, in spite of mercurochrome infections. He quoted statistics from the department of pathology of the Johns Hopkins Hospital and showed conclusively that there were no ulterior effects produced by mercurochrome upon the kidneys. As to dosage, he admitted that he frequently used large doses which had been followed with very severe reactions. Large doses were probably of importance in fulminating and desperate cases such as severe septicemias, but in milder cases he believes that now one should begin with 1 to 2 mg./kg. of body weight and by repeating the injection every two to three days, get equally good results with almost no reaction. The final conclusion was that in mercurochrome injected intravenously an extremely valuable method of combating

infections—local and general—and infectious diseases had been produced.

J. H. Hill took up briefly the experimental work with mercurochrome. She discussed especially the reactions, believing this to be twofold. When the drug comes immediately in contact with the organism, it is a direct germicide. But when it is given intravenously and a lesion far from the site of injection is healed, undoubtedly the direct action is much less important than the indirect action, that is, the effect upon the host and his defenses. This is somewhat parallel to foreign protein injection, although different in many ways.

As proof of the curative action of intravenous mercurochrome, experiments were cited in the treatment of pneumococcus septicemia in rabbits, of anthrax in guinea-pigs, of typhoid cholecystitis in rabbits, of experimental syphilis in rabbits and of abscesses in guinea-pigs. In all of these it was shown that definite curative action could be obtained, either in every case, as in the treatment of wounds, cholecystitis and syphilis, or with a much higher percentage of recoveries than in the untreated controls, as in the pneumococcus septicemia and anthrax series.

The possible anaphylactoid reaction of mercurochrome intravenously had been checked according to the methods of Hanzlik and no such constriction of the bronchioles, distension of the lungs, hemorrhages or thrombi could be found after 5 mg./kg. doses of mercurochrome as Hanzlik found after the use of a wide variety of substances.

It should be possible by considering all of the facts, the different actions of mercurochrome locally and intravenously, to bring together and correlate our information and so to do away with the differences of opinion about this drug which have hitherto existed.

PROCEEDINGS OF ACADEMY MEETINGS,
OCTOBER, 1926

STATED MEETINGS

Thursday Evening, October 7

ORDER

I. EXECUTIVE SESSION.

II. ADDRESSES.

- a. The treatment of surgical tuberculosis, Sir Henry Gauvain, London (by invitation).
- b. Relations of heart and lung in diseased conditions as observed by the fluoroscope, Edouard Rist, Paris (by invitation).
- c. Periarthritis nodosa, Francis Harbitz, Oslo (by invitation).

Thursday Evening, October 21

ORDER

I. EXECUTIVE SESSION.

- a. Action on proposed amendment to Article III, Section 2 of the Constitution, introduced at the Stated Meeting of May 6th, 1926, to increase the resident fellowship. The amended article to read: "The number of Fellows residing within twenty-five miles of New York City Hall shall be limited to seventeen hundred and the number of Fellows outside the twenty-five mile limit shall be limited to four hundred."
- b. Action on resolution proposed at Stated Meeting of May 6th, 1926: "RESOLVED: That the President be authorized to appoint a special committee to confer with representatives of the press on the possibility of the Academy's rendering assistance in giving out trustworthy statements on medical matters and that this resolution be transmitted to the Academy at its next meeting."

II. LECTURE.

Observations during the period of under-nutrition in Germany, Friedrich von Müller, Munich (by invitation).

The lecture is published in this number of the BULLETIN.

SECTION MEETINGS

SECTION OF PEDIATRICS—COMBINED MEETING OF THE SECTION
WITH THE PHILADELPHIA PEDIATRIC SOCIETY AND THE
NEW ENGLAND PEDIATRIC SOCIETY

Boston, Mass., October 16

PROGRAM

10:00–11:30 A.M., Children's Hospital Amphitheatre, 300 Longwood Avenue.

1. Some notes on infant feeding, Kenneth D. Blackfan, Joseph Johnston.
2. Some observations on the acid metabolism of intoxicated infants, Bengt Hamilton.
3. Variations in the diastase of the blood of infants, George Guest.
4. Reflex activity after transection of the spinal cord, Bronson Crothers.

11:45–12:30 P.M., Deaconess Hospital, Pilgrim Road.

1. Diabetes in childhood, Elliott P. Joslin.

12:45 P.M., Luncheon at the Harvard Medical School.

2:00–3:00 P. M., Peter Bent Brigham Hospital.

1. Neurological surgery in childhood, Harvey Cushing.

SECTION OF OPHTHALMOLOGY

Monday Evening, October 18

ORDER

I. READING OF THE MINUTES.

II. CLINICAL CASES.

- a. Unilateral exophthalmos with choked disc. Probable tumor of the optic nerve, L. W. Crigler.
- b. 1. Orbital neoplasm. Radium treatment. Result after three years' observation.
2. Case of high myopia. Extraction of lens with excellent visual results, H. H. Tyson.
- c. Lymphangioma of orbit. Removed by Kronlein operation. Lantern slides, Martin Cohen.

- d. An apparently cured case of glioma of the retina, Mark J. Schoenberg.
- e. Case of retinal detachment with unusual feature, Clyde E. McDannald.

III. PAPER OF THE EVENING.

Classification of retinal diseases. Retinitis externa and choroiditis, Manuel U. Troncoso (by invitation).

Discussion, Mark J. Schoenberg.

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday, October 26

I. READING OF THE MINUTES.

II. CASE REPORTS.

Case reports of pregnancy following irradiation for menstrual disturbance, A. J. Rongy.

III. PAPER OF THE EVENING.

The effect of roentgen rays upon the ovary, an experimental and morphologic study, with clinical deductions, M. R. Robinson.

Discussion by Harold Bailey, Harvey Matthews (by invitation).

LIBRARY NOTES

ACQUISITION OF OLDER BOOKS

It may be of some interest to Fellows of the Academy to hear about the older books which have been added to the library between January 1st and September 15th. Three of the most valuable books in the list given below were purchased for the sum of \$344.43 from a special fund which was subscribed to by some of the Fellows. Some of the other books came to the Academy through exchange or by gift and the remaining twenty-five cost \$352.86. One of these latter books (Bartholomaeus Anglicus, *De proprietatibus rerum*, 1483) is a very important incunabulum giving us an idea of the biological and medical knowledge of the Middle Ages and cost \$145.55, but even when we include this

one, the cost of these twenty-five old important books amounts to only three per cent. of the cost of the new books which have been received and of the periodicals which have arrived so far this year.

RECENT ACCESSIONS TO THE LIBRARY

NEW BOOKS

- Adams, H. Sanitary science.
Lond. Chapman. 1926. 188 p.
- Arvedson, J. Medical gymnastics and massage in general practice. 2. ed.
Lond. Churchill. 1926. 284 p.
- Bainbridge, J. S. Diet for the million.
Lond. Williams. 1926. 241 p.
- Bernhard, O. Griechische und römische Münzbilder in ihren Beziehungen zur Geschichte der Medizin.
Zürich. Füssli. 1926. 93 p.
- Bertwistle, A. P. & Shenton, E. W. H. A descriptive atlas of visceral radiograms.
Lond. Kimpton. 1926. 250 p.
- Boas, I. & Kelling, G. Diätetik der Magen- und Darmkrankheiten.
2. Aufl. Leip. Thieme. 1926. 242 p.
- Borchers, E. Allgemeine und spezielle Chirurgie des Kopfes.
Berlin. Springer. 1926. 382 p.
- Cameron, H. C. Diseases of children.
Lond. Oxford pr. 1926. 199 p.
- Carr-Saunders, A. M. Eugenics.
Lond. Williams. 1926. 256 p.
- Cochrane, W. A. Orthopaedic surgery.
Edinburgh. Livingstone. 1926. 528 p.
- Cock, R. Genesis v. evolution.
Lond. Stock. 1926. 77 p.
- Cokkinis, A. J. Mesenteric vascular occlusion.
Lond. Baillière. 1926. 159 p.
- Coster, G. Psycho-analysis for normal people.
Lond. Oxford pr. 1926. 232 p.

- Crew, T. Health compendium and health publicity.
Leicester. Reader co. 1926. 260 p.
- Deaver, J. B. Surgical anatomy of the human body.
2. ed. v. 1. Phila. Blakiston. 1926.
- Dock, L. L. & Quimby, J. C. Text-book of materia medica for
nurses.
8. ed. N. Y. Putnam. 1926. 317 p.
- Dorland, W. A. N. The x-ray in embryology and obstetrics.
Lond. Kimpton. 1926. 420 p.
- Eagleton, W. P. Cavernous sinus thrombophlebitis.
N. Y. Macmillan. 1926. 196 p.
- Emanuel, J. Auricular fibrillation.
Birmingham. Cornish. 1926. 31 p.
- Fano, G. Brain and heart.
Lond. Oxford pr. 1926. 142 p.
- Gregory, H. H. C. Infant welfare.
Lond. Lewis. 1926. 144 p.
- Grünwald, L. Lehrbuch der Kehlkopfkrankheiten. 3. Aufl.
München. Lehmann. 1925. 312 p.
- Guibé, M. & Quénu, J. Chirurgie de l'abdomen. 6. éd.
Paris. Masson. 1926. 388 p.
- Hajek, M. Pathology and treatment of the inflammatory diseases of the nasal accessory sinuses. 5. ed.
St. Louis. Mosby. 1926. 2 vols.
- Handbuch der experimentellen Therapie, Serum- und Chemotherapie. Hrsg. von A. Wolff-Eisner. 2. Aufl.
München. Lehmann. 1926. 790 p.
- Harris, D. T. Practical histology. 2. ed.
Lond. Lewis. 1926. 35 p.
- Hazlitt, V. Ability: a psychological study.
Lond. Methuen. 1926. 147 p.
- Heine, P. Kompendium der Milchuntersuchung für Tierärzte.
Hannover. Schaper. 1925. 102 p.
- Hernaman-Johnson, F. Radiotherapy in relation to general medicine.
Lond. Oxford pr. 1926. 211 p.
- Homburger, A. Vorlesungen über Psychopathologie des Kindesalters.
Berlin. Springer. 1926. 852 p.

- Kawamura, R. Studies on tsutsugamushi disease.
Cincin. Coll. med. Univ. of Cincin. 1926. 229 p.
- Kelley, I. V. Text-book of nursing technique.
Phila. Saunders. 1926. 366 p.
- Leeène, P. & Leriche, R. Thérapeutique chirurgicale.
Paris. Masson. 1926. 3 vols.
- Leonard, W. A. Organization and administration of the public health department.
Lond. Pitman. 1926. 148 p.
- Linnekogel, H. Die Behandlung der Tuberkulose . . . mit Calcium-Silicium . . . durch Inhalation.
München. Lehmann. 1925. 106 p.
- Lloyd, D. J. Chemistry of the proteins.
Lond. Oxford pr. 1926. 279 p.
- Lodge, Sir O. Evolution and creation.
N. Y. Doran. 1926. 160 p.
- McBride, P. The riddle of personality.
Lond. Heinemann. 1926. 190 p.
- Mercier, C. Criminal responsibility.
N. Y. Phys. & surg. book co. 1926. 256 p.
- Monrad-Krohn, G. H. The clinical examination of the nervous system. 3. ed.
Lond. Lewis. 1926. 201 p.
- Montague, J. F. The modern treatment of hemorrhoids.
Phila. Lippincott. 1926. 296 p.
- Morton, D. Invalid diet.
Lond. Heinemann. 1926. 98 p.
- Mullooney, J. J. The hygiene of the home.
Bost. Christopher. 1926. 195 p.
- National industrial conference board, inc. Medical care of industrial workers.
N. Y. Nat. ind. conf. bd. 1926. 112 p.
- Neave, F. G. The law relating to injuries to workmen. 3. ed.
Lond. Wilson. 1926. 160 p.
- Neumann, R. Atlas der radikal-chirurgischen Behandlung der Paradenosen.
Berlin. Meusser. 1926. 84 p.
- Nolen, W., Hymans v. d. Bergh, A. A. [et al.]. Lebensversicherungs-Medizin.
Berlin. Springer. 1926. 368 p.

- v. Noorden, V. & Isaac, S. *Verordnungsbuch und diätetischer Leitfaden für Zuckerkrankhe.* 3.-4. Aufl. Berlin. Springer. 1926. 135 p.
- Pannett, C. A. *The surgery of gastro-duodenal ulceration.* Lond. Oxford pr. 1926. 154 p.
- Paul, G. P. *A text-book of materia medica for nurses.* 5. ed. Phila. Saunders. 1926. 352 p.
- Porteus, S. D. & Babcock, M. E. *Temperament and race.* Bost. Badger. 1926. 364 p.
- Pryke, Sir Wm. [et al.]. *How to live long.* Lond. Hutchinson. [1926.] 127 p.
- Remington's practice of pharmacy. 7. ed. Phila. Lippincott. 1926. 2090 p.
- Richardson, F. H. *Parenthood and the newer psychology.* N. Y. Putnam. 1926. 200 p.
- Riddell, J. R. *Handbook of medical electricity and radiology.* Edinb. Livingstone. 1926. 239 p.
- Rievel, H. *Handbuch der Milchkunde.* Hannover. Schaper. 1926. 432 p.
- Rost, G. A. *Hautkrankheiten.* Berlin. Springer. 1926. 405 p.
- Rows, R. G. & Bond, W. E. *Epilepsy.* Lond. Lewis. 1926. 138 p.
- Scheidt, W. *Allgemeine Rassenkunde.* v. 1. München. Lehmann. 1925. 585 p.
- Schilder, P. & Kauders, O. *Lehrbuch der Hypnose.* Wien. Springer. 1926. 110 p.
- Siegrist, A. *Refraction und Akkommodation des menschlichen Auges.* Berlin. Springer. 1925. 148 p.
- Skramlik, E. von. *Handbuch der Physiologie der niederen Sinne.* v. 1. Leip. Thieme. 1926.
- Smith, W. J. *A medical and surgical help for shipmasters and officers in the merchant navy.* 6. ed. Lond. Griffin. 1926. 337 p.
- Stopes, M. C. *The human body.* Lond. Gill pub. co. 1926. 224 p.

- Sünner, P. The brain and the mind.
Lond. Allen. 1926. 112 p.
- Thomson, J. A. Heredity. 5. ed.
Lond. Murray. 1926. 542 p.
- Townsend, H. Social work: a family builder.
Phila. Saunders. 1926. 247 p.
- Transactions of the American laryngological association. 1925.
- Transactions of the College of physicians of Philadelphia. 1925.
- Watson, J. K. A handbook for nurses. 7. ed.
Lond. Faber. 1926. 802 p.
- Wilkinson, W. C. The principles of immunity in tuberculosis.
Lond. Nisbet. 1926. 141 p.

OLDER BOOKS

(ACQUIRED BETWEEN JANUARY 1 AND SEPTEMBER 15, 1926)

- An account of the New York Hospital.
N. Y. Collins & Co. 1811. 65 p.
- Albertus Magnus. Alberti Magni drei bücher von wunder. . . .
[Frankfurt a. M. Egenolph] 1537. 19 l.
- Astruc, Jean. Tractatus pathologicus.
Genevae. Cramer . . . 1743. 232 p.
- Aubrey, John. Miscellanies upon various subjects. . . .
5. ed. Lond. Reeves & Turner. 1890. 221 p.
- Bartholomaeus, Anglieus. De proprietatibus rerum.
[Nurenberge. A. Koburger. 1483] unp.
- Blaine, Delabere. Canine pathology.
4. ed. Lond. Longman, Orme Co. 1841. 324 p.
- Boerhaave, Hermannus. Institutiones et experimenta chemiae.
Venetiis. S. Coleti. [1726].
v. 1—292 p.
v. 2—350 p.
- Boyle, Robert. Of the reconcileableness of specifick medicines. . . .
Lond. S. Smith. 1685. 225 p.
- Bridges, J. H. Life and work of Roger Bacon.
Lond. Williams & Norgate. 1914. 173 p.
- Brown, John. Horae subsecivae. Locke & Sydenham. . . .
Edinburgh. D. Douglas. 1890. 468 p.

- Browne, (Sir) Thomas. Certain miscellany tracts.
 Lond. C. Mearne. 1684. 215 p.
- Browne, (Sir) Thomas. Posthumous works. . . .
 Lond. Curl. 1712. var. p.
- Caius, Johannes. The works of Jean Caius, M.D. . . .
 Cambridge, [Eng.] Univ. Pr. 1912. unp.
- Cassal, J. Traicté de la peste. . . .
 Lyon. B. Rigaud. 1589. p. 55.
- Celsus, Aurelius Cornelis. De medicina.
 [Florentiae. a Nicolao imp. 1478] var. p.
- Cheyne, George. An essay on regimen—five discourses.
 3. ed. Lond. D. Browne. 1753. 344 p.
- Cockburn, William. The nature and cure of fluxes.
 3. ed. Lond. J. Clarke. 1724. 344 p.
- Digby, (Sir) Kenelm. Powder of sympathy. . . .
 3. ed. Lond. R. Lowndes. 1660. 152 p.
- Eliot, Walter Graeme. Portraits of the noted physicians of New
 York.
 [N. Y. 1900] 200 p.
- Evening thoughts. By a physician.
 Lond. J. Van Voorst. 1850. 144 p.
- Fabricius ab Aquapendente, Hieronymus. L'opere chirurgiche. . . .
 Bologna. G. Longhi. 1678. 359 p.
- Ferguson, John. Bibliotheca chemica. . . .
 Glasgow. J. Maclehose & sons. 1906.
 v. 1—487 p.
 v. 2—598 p.
- Fleming, George. Pasteur and his work. . . .
 Lond. W. Clowes & sons. 1866. 75 p.
- Franklin, Alfred. La vie privée d'autrefois. Les médecins.
 Paris. E. Plon. 1892. 305 p.
- Galen, Cladius. De naturalibus facultatibus libri tres. . . .
 Lugduni. apud G. Rovillium. 1550. 205 p.
- Gesner, Conrad. Bibliotheca instituta et collecta. . . .
 Tigri. apud Christophorum Froschoverum. 1574.
 691 p.
- Gilbert, William. De magnete. . . .
 Lond. P. Short. 1600. 240 p.

- Gunther, Robert Theodore. Early science in Oxford.
Oxford. 1923. 407 p.
- Haller, Albertus. Physiology; being a course of lectures. . . .
2. ed. Lond. G. Robinson. 1772.
v. 1—339 p.
v. 2—498 p.
- Highmore, Nathanael. The history of generation. . . .
Lond. J. Martin. 1631. 141 p.
- Kennett, White. Bibliothecae Americanae primordia.
Lond. J. Churchill. 1713. 275 p.
- Kipling, Rudyard. Doctors. An address delivered to the students. . . . Middlesex hospital. . . .
Lond. Macmillan & co. 1908. 31 p.
- Laurentius, Andreas. Toutes les oeuvres. . . .
Rouen. J. Berthelet. 1661. 572 p.
- de Leon, Andres. Practico de morbo gallico. . . .
Valladolid. Sanche. 1605. 126 p.
- Life (The) and letters of Charles Darwin. . . .
Lond. J. Murray. 1887.
v. 1—395 p.
v. 2—393 p.
v. 3—418 p.
- Mesue *Damascenus*, Joannes. De morbis internis curandis liber.
Lugundi. A. Vincentium. 1551. 493 p.
- Moore, Charles Hewitt. On going to sleep.
Lond. R. Hardwicke. 1868. 60 p.
- Nightingale, Florence. Notes on nursing: what it is and what it is not.
Lond. Harrison. [1860] 79 p.
- Phinney, H. F. The water cure in America. . . .
2. ed. N. Y. J. Wiley. 1849. 288 p.
- Poems and songs of patriotism and war. Ed. by Charles L. Dana.
Woodstock, Vt. Elm Tree Pr. [1918] 35 p.
- Portius, Franciscus. Medica decas, ejusdem authoris. . . .
Lutetiae Parisiorum. M. Mondiere. 1613. 462 p.
- Quincy, John. The dispensatory of the Royal College of Physicians in London. . . .
2. ed. Lond. R. Knaplock. 1727. 362 p.

Robinson, Bryan. Observations on the virtues and operations of medicines.

Dublin. Ewing, Smith & Faulkner. 1752. 216 p.

Shapter, Thomas. The history of cholera in Exeter in 1832.

Lond. J. Churchill. 1849. 297 p.

Smith, Eustace. On wasting disease of infants and children.

4. ed. Lond. J. & A. Churchill. 1884. 372 p.

Sylvius [de la Boë] Franciscus. Institutie medica. . . .

[s. 1. 1770?] 310 p.

Sylvius [de la Boë] Franciscus. Trajecti ad Rhenum. G. v. d.

Water. 1695.

v. 1—582 p.

v. 2—934 p.

Tennent, John. Physical enquiries.

Lond. T. Gardner. 1742. 69 p.

Tissot, Simon André D. L'onanisme. . . .

Nouv. ed. Paris. Bossange, Masson & Besson. 1805.

162 p.

Tweedie (Mrs.) Ethel. George Harley, F.R.S. The life of a London physician. . . .

Lond. Scient. Press. 1899. 360 p.

Warren, Edward. Boyleston prize dissertations. . . . 1838 and 1839.

Phila. A. Waldie. 1840. 122 p.

Willis, Thomas. Pathologicae cerebri et nervosi. . . .

Amstelodami. Elzevirium. 1668. 338 p.

CEREMONIES IN CONNECTION WITH THE OPENING OF THE NEW BUILDING OF THE ACADEMY

A dinner in honor of the new Honorary Fellows will be given at the Waldorf-Astoria Hotel on Wednesday, November 17, at 7 p. m. Addresses will be delivered by Dr. Samuel A. Brown, President, The New York Academy of Medicine, and several of the Honorary Fellows.

The opening exercises at the new building will be held on Thursday, November 18, at 3.30 p. m., Fifth Avenue and One Hundred and Third Street.

Invocation by Rev. Henry Sloane Coffin, D.D.

Addresses: The Academy—its Services in Medical Progress, Dr. Samuel A. Brown, President, The New York Academy of Medicine. The Building of the Academy, Dr. Arthur B. Duel, Chairman, Building Committee.

The Fellows and their friends are invited to attend a reception and inspection of the building to be held on Thursday, November 18, from 4.00 to 6.00 p. m., Fifth Avenue and One Hundred and Third Street.

The first meeting to be held in the new building will be a Stated Meeting of the Academy in Hosack Hall, Fifth Avenue and One Hundred and Third Street, Thursday, November 18, at 8.30 p. m. At this meeting there will be an election of Honorary Fellows and the Carpenter Lecture will be delivered by Michael I. Pupin, of Columbia University, on "Ionization and Chemical Reactions."

ACTION ON INCREASED MEMBERSHIP AND THE RELATIONS OF THE ACADEMY TO THE PRESS

On May 6 a resolution was introduced at a Stated Meeting of the Academy, to amend the Constitution so as to increase the number of Fellows residing within 25 miles of the City Hall, New York City.

At a meeting on October 21, the Academy voted to increase the number of resident Fellows from 1,625 to 1,700.

During the Spring, a number of discussions were held at meetings of the Council of the Academy as to whether or not it would be proper for the Academy to issue statements to the press on medical matters, which would be of educational value to the public. No definite plan was considered except that if such a plan were agreed upon by the Academy, statements would have to be made in the name of the Academy and not in the name of any of the Fellows.

The Council recommended to the Academy that the matter be considered, and the following resolution was introduced at a Stated Meeting on May 6:

RESOLVED: that the President be authorized to appoint a special committee to confer with representatives of the press on the possibility of the Academy's rendering assistance in

giving out trustworthy statements on medical matters and that this resolution be transmitted to the Academy at its next meeting,

and at a meeting of the Academy on October 21 it was moved and seconded that the matter be laid on the table.

It was then pointed out that the adoption of a resolution would not in any way complicate the situation, nor would it authorize the President or the Council to take any specific action,—the resolution only authorized the President to appoint a special committee to confer with the representatives of the press. It was evident that the Fellows were opposed to any discussion of the matter and the motion to table was adopted.

CANDIDATES RECOMMENDED FOR ELECTION TO FELLOWSHIP OCTOBER 6, 1926

Rudolph Boenke, M.D., 320 Grand Avenue, L. I. City.

Samuel Gitlow, M.D., 865 Walton Avenue.

Roy Biggs Henline, M.D., 901 Lexington Avenue.

Edward Crane Lyon, Jr., M.D., 100 East 66th Street.

John Sturdivant Read, M.D., 174 Clinton Street, Brooklyn.

CANDIDATES RECOMMENDED FOR ELECTION TO ASSOCIATE FELLOWSHIP

Charles Francis Bodecker, D.D.S., 576 Fifth Avenue.

Homer Folks, A.B., 105 East 22nd Street.

Edgar Grim Miller, Jr., Ph.D., 180 Claremont Avenue.

Oliver Smith Strong, Ph.D., Livingston Hall, Columbia Univ.

Frank Thorn Van Woert, M.D.S., 302 East 35th Street.

DEATHS OF FELLOWS OF THE ACADEMY

Joshua Lindley Barton, M.D., 117 East 61st Street, New York, N. Y., graduated in medicine from College of Physicians and Surgeons, New York City, 1881; elected a Fellow of the Academy December 5, 1889; died September 10, 1926.

William Francis Campbell, A.B., M.D., 394 Clinton Avenue, Brooklyn, New York, graduated in medicine from Long Island College Hospital, 1892; elected a Fellow of the Academy June 5,

1902; died September 7, 1926. Dr. Campbell was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons, a member of the American Surgical Society and a member of the American Anatomical Society.

Franklin Abbott Dorman, A.B., A.M., M.D., 121 East 60th Street, New York, N. Y., graduated in medicine from College of Physicians and Surgeons, New York City, 1898; elected a Fellow of the Academy May 5, 1904; died August 6, 1926. Dr. Dorman was a Fellow of the American Medical Association, a Fellow of the American College of Surgeons and a member of the Obstetrical Society.

Arthur Middleton Jacobus, M.D., 131 West 70th Street, New York, N. Y., graduated in medicine from Bellevue Hospital Medical College, New York City, 1876; elected a Fellow of the Academy December 4, 1879; died September 18, 1926. Dr. Jacobus was a Fellow of the American Medical Association, a member of the Obstetrical Society and a member of the Society of Alumni of Presbyterian Hospital. He was also Attending Physician of Tuberculosis at Vanderbilt Clinic.

Fredrick Samuel Mandlebaum, M.D., 1300 Madison Avenue, New York, N. Y., graduated in medicine from Bellevue Hospital Medical College, New York City, 1889; elected a Fellow of the Academy May 5, 1904; died August 7, 1926. Dr. Mandlebaum was a fellow of the American Medical Association, a member of the American Pathological and Bacteriological Society, a member of the American Cancer Research Institute, a member of the Pathological Society and a member of the Society of Associated Alumni of Mt. Sinai Hospital.

Charles Edward Nammack, Ph.D., M.D., 379 Park Avenue, New York, N. Y., graduated in medicine from Bellevue Hospital Medical College, New York City, 1881; elected a Fellow of the Academy May 1, 1884; died October 4, 1926. Dr. Nammack was a Fellow of the American College of Physicians, a member of the Society of Alumni of Bellevue Hospital, Visiting Physician at Bellevue Hospital, Consultant Physician at St. Vincent's Hospital, and Professor of Clinical Medicine, Cornell University Medical College.

Council, 4th Wednesday.
 Committee on Library, 2nd Tuesday.
 Committee on Admission, 1st Wednesday.
 Public Health Committee, Mondays.
 Committee on Medical Education, 2nd Thursday.
 Building Committee, 1st and 3rd Tuesdays.
 Publication Committee, date varies.
 Program Committee, date varies.

DATES OF SECTION MEETINGS

Dermatology and Syphilis, 1st Tuesday.
 Surgery, 1st Friday.
 Neurology and Psychiatry, 2nd Tuesday.
 Pediatrics, 2nd Thursday.
 Otology, 2nd Friday.
 Ophthalmology, 3rd Monday.
 Medicine, 3rd Tuesday.
 Genito-Urinary Surgery, 3rd Wednesday.
 Orthopedic Surgery, 3rd Friday.
 Obstetrics and Gynecology, 4th Tuesday.
 Laryngology and Rhinology, 4th Wednesday.
 Historical and Cultural Medicine, date varies.

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THOMAS H. CURTIN

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L. PIERCE CLARK
CHARLES E. ATWOOD

TABLE OF CONTENTS

Editorial:

Series and families of diseases: FIELDING H. GARRISON.....	491
Observations during the period of undernutrition in Germany: FRIEDRICH VON MÜLLER.....	502

Abstracts of papers presented at section meetings:

Section of Genito-Urinary Surgery, March 17 and May 21, 1926: DRS. BEER, CROWELL, HAGER and MAGATH, YOUNG and HILL.....	516
Proceedings of Academy meetings, October, 1926.....	522

Library notes:

Acquisition of older books.....	524
Recent accessions to the Library.....	525

Announcements:

Ceremonies in connection with the opening of the new building	532
Action on increased membership and the relations of the Academy to the press.....	533
Candidates recommended for election to Fellowship, October 6	534
Deaths of Fellows of the Academy.....	534
Donations to the Library funds.....	537
Form of bequests.....	537
Dates of meetings	537

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BACON'S RELATION TO MEDICINE

Lord Bacon had already climbed far up the slippery heights of place and power when he wrote, at the age of 37:

"It is a strange desire to seek power and to lose liberty: or to seek power over others and to lose power over a man's self. The rising unto place is laborious; and by pains men come to greater pains: and it is sometimes base; and by indignities men come to dignities. The standing is slippery, and the regress is either a downfall or at least an eclipse, which is a melancholy thing."

Never has there been, perhaps, a preachment more diametrically opposed to a man's practice, a mind of greater wisdom and sagacity, yet powerless, in supreme situations, to choose the simple, straight course which is the plain pathway of truth and honor. As a mere boy, Bacon revealed one ply of his character when he gained the favor of Queen Elizabeth by a deft flattery. The same boy broke open his toy drums and trumpets "to look for the sound," abandoned his games to investigate the cause of an echo, and at twelve was busy with the art of legerdemain. In the gloomy period following his downfall, Bacon lost his life from exposure to cold in the prosecution of a biological experiment. Given his genius, his strong common sense, his well-balanced mind, he would undoubtedly have made a great name as a physician.

No other Englishman, between Linaere and Harvey, did more for medicine, the object of his particular regard. The story of Bacon's life, indeed, forces upon us the conviction of Allbutt: "Francis Bacon had done better to have gone with Harvey to Padua." The rock upon which Bacon split was his legal training, to which it is only fair to add his lowered vitality, the equivalent, in the long run, of a cold heart, and his social station, which, centering upon creature comforts and worldly place, made

for the enslaved or passive mind. The rough handling dealt out to Bacon in Macaulay's well-known essay expresses the traditional Anglo-Celtic contempt for lack of pluck in a first-class situation—

“But More of More Hall,
with nothing at all,
He *slew* the dragon of Wantley.”

Yet, at the age of 35, Bacon incurred the lasting hatred of Elizabeth by opposing her demand for subsidies in Parliament, an action not devoid of the generosity of youth, as voicing the rights of the people. He never repeated the experiment. In 1601, he submits to be the passive agent in the betrayal and execution of Essex, his great-hearted friend, who had enriched him by the gift of an estate worth half a million in present money. In 1621, we find him disgraced and shorn of his honors as a bribe-taking statesman, in reality the helpless scapegoat of Buckingham.

Time, which effaces all things, has dealt gently with the memory of Bacon. A physician would see this friend of medicine as, first of all, a man who was all mind, of delicate health, a victim of circumstance, snatched from Cambridge at sixteen to be trained for diplomacy, forced to take up the law through loss of his inheritance, a political thinker in advance of his time, at the beck and call of tyrannous monarchs and overweening patrons, beset by enemies all his life and eventually waylaid by them, always in other people's hands, a well-born gentleman in his breeding, of expensive personal tastes, and, for that reason, perhaps, daunted by the fear of coming down in the world. A homely German proverb runs: “To be poor is tolerable: to become poor is terrible.”¹ In Bacon's case, the English custom of placing children in unsuitable positions, without reference to their vocational aptitudes, was a virtual selling into slavery. As Ben Franklin observed: “A good kicking out of doors is sometimes better than all the rich uncles in the world.” Bacon's uncle was no less than Burleigh, Elizabeth's great minister, who, however, disliked him and blocked his chances for preferment, while his cousin, Robert Cecil, hated him. We must judge of

¹ *Arm sein ist nicht schlimm: arm werden ist schrecklich.*

Bacon by those pathetic lines from his will, which so well illustrate the simplicity and compact brevity of his literary style: "For my name and memory, I leave it to men's charitable speeches, and to foreign nations and to the next age."

Foreign nations, as well as his own, have not failed to judge of Bacon in the light of his real genius. Apart from the idolatry of Spedding, he was admired by Leibnitz, Boerhaave, Haller, Voltaire, d'Alembert, Virchow and Pagel, as well as by Boyle, Sydenham and Pringle. Three hundred years after his death (April 9, 1926), his scientific reputation has taken on new aspects and requires new appraisals. This has been recently attempted by two eminent medical historians, Dr. Charles Singer (London), who deals with Bacon's relation to science,² and Professor Max Neuburger, who analyzes his contribution to medicine.³

At this time of day, Bacon's relation to the science of the Renaissance is seen to be that of the forerunner rather than of the interpreter or participant. As Macaulay expounds at great length, Bacon did not invent inductive reasoning, which was known as such to Aristotle and is employed constantly by any of us in the ordinary transactions of life; nor did he elucidate it particularly well. His elaborate categories are more complex than those of the mediaeval logicians and "only tell us to do what we are all doing." In 1863, the chemist, Liebig, published a slashing critique of Bacon's contribution to inductive science.⁴ He claims, not without venom, that many of Bacon's alleged experiments were lifted bodily from the works of Gilbert, Paracelsus, Drebbel and other actual workers whom he ignored or despised; that his own experiments were often fantastic and ill-considered; that his reasoning about them is sometimes delusive, confusional and that of a lawyer, bent upon deception. That Bacon lacked the training for experimentation was at once apparent to the keen judgment of William Harvey, who admired his wit and style but said that "he writes philosophy (science) like a Lord Chancellor." Singer points out that Bacon is the solitary instance of an attempted fusion of law and science. "It

² Singer: *The Nation*, Lond., 1926, XXXIX, 41-43.

³ Neuburger: *Med. Life*, N. Y., 1926, XXXIII, 149-169.

⁴ Liebig: *Ueber Francis Bacon von Verulam*, Munich, 1863.

may be," he adds, "that it was just Bacon's legal powers and legal training that shut him out from a real appreciation of the scientific process." That process Singer defines as essentially an act of judgment, comprising two distinct mental moves, viz., the making of a discovery and the demonstration of its truth. In neither of these did Bacon ever succeed. His real service to science, as Singer sets forth, lies in the clean sweep he made of Platonism and scholasticism, the influence of his writings upon the eventual foundation of the Royal Society, as acknowledged by Boyle, and upon British psychology, beginning with Locke. To these we may add the actual prediction of scientific institutions of modern type in the "House of Solomon" and the "New Atlantis." Interesting are Bacon's four categories of "*Idols*" or misleading notions, so often cited by Osler, and the basis of Harvey Robinson's thesis that all human strife and error arises from confusing opinions about things with the things themselves:

The *Idola Tribus* (idols of the tribe) are the fallacies of the herd instinct and of mob psychology, to which all men are liable. The *Idola Specus* (idols of the cave) are the errors inherent in our own minds, our personal prejudices. The *Idola Fori* (idols of the market-place) imply our superstitious reverence for empty catchwords and clap-trap, as opposed to reality. The *Idola Theatri* (idols of the theatre) are errors springing from our tendency to swallow cut-and-dried systems of thought.

To these *Idola*, which reveal the acumen of the great lawyer, Singer adds a fifth, the *Idola Academiae* (idols of the schools), errors due to following blind, learned rules instead of forming independent judgments. "It was this fifth idol," says Singer, "that prevented Bacon from entering the promised land, of which but a Pisgah view was granted him." But here, it is interesting to note that the idea of the recent series of books bearing titles such as "Icarus or the Future of Science," or "Tantalus or the Future of Man," really derives from Bacon's "Wisdom of the Ancients." Thus Bacon's relation to science was really prophetic and (so to say) heraldic of the new order of things. There is no exaggeration in his claim that "he rang the bell which called the wits together."⁵

Macauley praises Bacon for dispensing with the idealism of Plato, which aimed to make men wiser and more virtuous, sub-

⁵ Cited by Singer.

stituting therefor the plain utilitarian motive of increasing our material and physical well-being. Liebig denounces this Baconian materialism on the ground that the true aim of science is the discovery of truth. It is none the less a fact, however, that the utilitarian motive has actually organized and accelerated scientific research and that the physical well being of man is a very effective aim for medicine and sanitation. It is here, in fact, that we find Bacon at his best. He was keenly interested in medicine, and, in the opinion of the clinician Bamberger, "would have made a brilliant success had he devoted himself to it." Bacon was, indeed, the first to stress the needs and deficiencies of Renaissance medicine. He said of the physicians of his time that they saw things from afar off, as from a high tower, and that, like spiders, they spun webs of sophistry out of their own bowels.⁶ To Bacon, the aim of medicine, is threefold, viz., to maintain health, heal disease and prolong life. This important section of the "Advancement of Learning" is analyzed at length by Professor Neuburger. In preserving health, Bacon values physical exercise above temperance, which he regards as a much overrated virtue. As to the special aim of medicine, the cure of disease, he notes that the Hippocratic plan of taking accurate case histories has fallen into disuse, so that details are passed over as commonplaces. Anatomical studies should be extended to structural variations in different people (our present doctrine of the constitution) as helping to elucidate unknown diseases; to the notation of pathological formations in dissection; to the study of the humors (secretions); to locating the "footsteps and impressions of diseases and injuries" in animals, as well as in man; and to the "dissection of beasts alive" to elucidate what goes on in life. Bacon enlarges upon the necessity of a special study of incurable diseases, the critical revision of pharmacology, remedies for the alleviation of pain, euthanasia, and the possibility of making artificial mineral waters. The third aim of medicine, the prolongation of life, is expounded in Bacon's *Historia vitæ et mortis*, which, as conveyed in Neuburger's elaborate analysis, rests upon the old doctrine of vital spirits and is otherwise replete with those dietetic and therapeutic whimsies with

⁶ Cited by Allbutt.

which the Renaissance literature abounds. It is a striking documentation of Bacon's lively interest in medicine. Neuburger states that it was admired by Haller and held the field, as a manual of personal hygiene, until the advent of Hufeland's *Makrobiotik*. Better evidence of Bacon's ability as a thinker on medicine is to be found in the *De augmentis* and *Sylva sylvarum*, notably his views as to the value of psychotherapy in mental disorders, the future possibilities of microscopy in examining the blood and the urine, the advantages of administering drugs in a certain order (*filum medicinale*), the use of herbs and fruits as medicines, and the means of preventing putrefaction. Here, again, Bacon is the prophet and the herald. Some of his best medical aphorisms are to be found in the *Essays*, which gave him his place as the greatest English prose writer of Shakespeare's time, and which, through their purple patches of poesy, have even given color to the theory that Bacon wrote Shakespeare's plays. But the style of the essays is, in the main, prosy compact, lawyer-like, sometimes Biblical, with knottier Latin citations than we find in Montaigne. The prudent, low-spirited Bacon as the supposititious author of *Macbeth* or the *Merry Wives* or *A Midsummer Night's Dream* is as unthinkable as some musical theorist, like Richter or Jadassohn, as the composer of the *Eroica* or the *Bacchanale* in *Tannhäuser*. One misses the *désinvolture*, the *élan vital*, the daemonic quality of true artistic genius. Bacon excelled in Dryden's "other harmony of prose." A poet he was not.

Two of the *Essays*, viz., "Of Regiment of Health" and "Of Deformity" are medical in content. In the former, Bacon notes that what a man finds most suited to himself is really "the best physic to preserve health," that youth can stand many excesses, that change of regimen in age should be extensive rather than confined to one item, that to inure the body to hardship will enable it to weather diseases better. The well-known peculiarities of doctors in the Middle Ages and later are conveyed in Bacon's suggestion that it is better to employ two physicians than a doctor who plays up to the patient's whims or one who handles his case mechanically, without reference to his real condition in either event. In the essay on Deformity, Bacon elucidates the Adler inferiority-complex in the spirit of the man of affairs who

has noticed that compensatory hypertrophy of talent and effort is usual in people to whom nature has been otherwise unkind :

“Whosoever hath anything fixed in his person that doth induce contempt, hath also a perpetual spur in himself to rescue and deliver himself from scorn. Therefore all deformed persons are extreme bold, first, as in their own defence, as being exposed to scorn, but in process of time by a general habit. . . . So that upon the matter, in a great wit, deformity is an advantage to rising.”

A man so sagacious and observant might obviously have made a great physician. Professor Neuburger approaches the great Lord Chancellor in this way, with the comprehending sympathy of a true medical man, and, one might almost think, with regard to the lines which Bacon wrote in the dark days before his death, in the exquisite English of which he was so assured a master :

“Death arrives gracious only to such as sit in darkness, or lie heavy burthened with grief and irons; to the poor Christian that sits bound in the galley; to despairful widows, pensive prisoners and deposed kings; to them whose fortune runs back and whose spirits mutiny; unto such death is a redeemer, and the grave a place for retiredness and rest.

These wait upon the shore of death and waft unto him to draw near, wishing above all others to see his star, that they might be led to his place; wooing the remorseless sisters to wind down the watch of their life, and to break them off before the hour. . . .

And since I must needs be dead, I require it may not be done before mine enemies, that I be not stript before I be cold; but before my friends. The night was even now; but that name is lost; it is not now late but early. Mine eyes begin to discharge their watch, and compound with this fleshly weakness for a time of perpetual rest; and I shall presently be as happy for a few hours, as I had died the first hour I was born.”

F. H. GARRISON

(a) IS EPIDEMIC POLIOMYELITIS PREVENTABLE
AND DOES A SPECIFIC FORM OF TREATMENT
OF THE DISEASE EXIST?

HAROLD AMOSS

Johns Hopkins Medical School

(Abstract)

A discussion of the first question: "Is epidemic poliomyelitis preventable"—is obviously based on the existing knowledge of the pathogenesis of this disease. It is fairly definitely established that the virus gains entrance into the central nervous system by way of the nasopharynx and that the main channel of exit from the body is by the same route.

It may be assumed that in epidemics of considerable proportion such as the outbreak of 1916, the virus becomes fairly widely distributed; but the morbidity rate was low. Apparently, virus implanted in the nasopharynx does not invariably gain entrance into the central nervous system, indeed the low susceptible rate of about 1-200 shows that only in exceptional instances does poliomyelitis result. Obviously the virus thus implanted meets with some resistance.

The failure of the virus to infect is explained in part by the following observations. Experimental studies have shown that washings from the nasopharynx of some apparently healthy persons neutralize the virus. In other individuals particularly children and in adults with acute or chronic irritation of the nasopharynx, this property of the nasal washings is absent. This neutralizing power of the nasal washings may be regarded as the first line of defense against the entrance of the virus.

A second defensive mechanism is suggested by other experiments on monkeys. For example if a pledget of cotton soaked in virus suspension is placed well back in the nares of monkeys and removed after two hours, the animals usually remain well. If however the cotton remains for twelve hours, the monkeys become infected and experimental poliomyelitis ensues. Thus the permeability of the nasal mucous membranes is increased by the long continued contact and, furthermore, irrigation of the nasopharynx with the ordinary antiseptic solutions such as H_2O_2 ,

argyrol, etc., in the strength often employed as preventive agents, increases the permeability of the mucous membranes. These experiments may have a bearing on the question of human carriage of the virus. The virus has been recovered from healthy persons who have been in intimate contact with poliomyelitic patients. Nasal washings from carriers do not neutralize the virus, and it follows that the intact mucous membranes prevent the more intimate contact of the virus with the central nervous system.

A third mechanism of defense in the monkey is rendered probable by the fact that aseptic chemical irritation of the meninges allows easy entrance of the virus from the blood stream or the nasopharynx. Thus the intraspinal injection of 2 cc. of normal horse serum into a monkey 14 hours before nasal application or intravenous injection of the virus renders the monkey susceptible to the infection. Control animals to which the virus is applied in like manner but without the previous intraspinal injection do not become infected.

We may now consider the course of events when the virus is implanted on the nasal mucous membrane.

If the first line of defense, namely, the neutralizing power of the nasal secretions, is present, the virus is destroyed. In the absence of neutralizing substances in the nasal secretions, the recipient of the virus becomes a carrier or case of the disease according to the presence or absence of the second and third mechanisms of defense.

PREVENTION

In the prevention of poliomyelitis, we know of no means of predicting the presence of the third line of defense. We have made studies on the variation of the neutralizing power of the nasal washings *i.e.*, first lines of defense in the same individual over some months: during the period of a common cold the washings did not neutralize. In one period of observation extending over several weeks, the neutralizing properties were maintained when daily irrigation with warm isotonic salt solution was practiced, but three days after discontinuing the irrigation the washings no longer neutralized.

Mild antiseptics when used as a nasal wash in monkeys increase the susceptibility. One hesitates therefore to recommend this as a prophylactic measure in human beings.

PREVENTION BY SPECIFIC METHODS

Passive Immunization by the injection of serum from recovered cases prevents the infection in monkeys when the virus is applied by the nasal route. Doubtless this method would be successful in man. But there are practical difficulties: (1) of obtaining sufficient serum; (2) the lack of methods for detecting the susceptible persons.

Obviously passive immunization on a large scale as a means of preventing a disease possessing such a low attack rate, is impractical. Thus to reduce the morbidity by one, about two hundred children should be immunized.

Active Immunization has not been applied in human beings. In monkeys our experiments analogous to the Pasteur method of preventing rabies, have failed to confer immunity. Two years ago we described an unusual strain of virus exhibiting over a series of transfers in monkeys, a mild degree of infective power and marked degree of protective effect for the monkey. In these experiments intracerebral injections were employed. In our experience, protection or active immunization arises only in those animals in which there was evidence of actual invasion of the central nervous system.

Should one consider the application of such a method in man, it should be recalled that the mortality in rabies is 100 per cent. and only 25 per cent. in poliomyelitis, and there is the corresponding great difference in the attack rate in the two diseases.

EFFICIENCY OF QUARANTINE METHODS

The Vermont method of isolating for at least 17 days all contacts has apparently been successful in preventing local outbreaks from becoming epidemics. Yet the fact that poliomyelitis often pounces upon a few individuals in a community and then suddenly ceases, make it difficult to adjudge the efficiency of such methods. We have collected certain experimental and epidemiological facts bearing on the question of the period of infectivity and incubation period, but the time is too short to give these in detail.

As a final word I should like to call attention to the fact that we have detected the virus in nasal washings six days before onset of poliomyelitis. Thus the prevention of poliomyelitis be-

comes a problem similar to the control of measles and diphtheria, and like them may be regarded as an acute upper respiratory disease. *Prevention* then reduces itself to the same measures employed for reducing the incidence of measles and diphtheria, but on account of the *low attack rate* may be much simpler.

There are undoubtedly healthy carriers and non-paralytic cases which add to the complexity of the problem.

Whether quarantine measures are of value one cannot say—but it would be a bold public health officer who would disregard it even in the absence of assurance.

DOES A SPECIFIC FORM OF TREATMENT EXIST?

Treatment with convalescent serum will be discussed by Dr. Draper. He will doubtless produce evidence to prove that convalescent serum has neutralizing power and can retard or prevent the disease in monkeys, thus theoretically there is a specific serum, but we have injected repeatedly over long periods sheep, calves, donkeys, horses, without producing a neutralizing serum. No antibodies are provoked without actual involvement of the central nervous system. Apparently it is impossible to produce a specific antipoliomyelitic serum in non-susceptible animals.

Reports from time to time during the past few years have been made on the use of so-called antipoliomyelitic sera. These are in reality antistreptococcic sera prepared by immunizing horse with strains of streptococci isolated from the central nervous tissues of human cases of poliomyelitis.

The relation of streptococci to poliomyelitis can be described best by reference to experimental evidence:

Streptococci have been cultivated from the human poliomyelitic central nervous tissues and from the brain and spinal cord of monkeys dead of experimental poliomyelitis. Superficial consideration of these facts may invite the inference that there is a causal relationship between these organisms and the specific disease.

Further studies however lead to entirely different conclusions:

As is well known the virus of poliomyelitis passes easily through a Berkefeld candle which withholds ordinary bacteria. The filtrate of a 5 per cent. suspension of poliomyelitic nervous tissues, even in the minute dose of .001 cc., will produce experi-

mental poliomyelitis when injected intracerebrally into monkeys. Yet aerobic and anaerobic cultures of 10 cc. of such a filtrate remain sterile.

The following experiment brings out more definitely the relation of streptococci to the poliomyelitis.

Two monkeys are injected intracerebrally with an infective dose of a Berkefeld virus filtrate, shown to be sterile by all methods of culture. In due time both monkeys show symptoms of experimental poliomyelitis and become prostrate. One monkey is etherized and the brain and cord removed aseptically. Cultures prepared in various kinds of media, aerobic and anaerobic and under partial oxygen tension remain sterile; such suspensions however are highly potent in transferring the experimental disease. The other monkey is allowed to die in the natural course of events in the experimental disease. From the brain and cord of the second monkey, streptococci are easily recovered. The human case of the disease obviously corresponds to the second monkey.

The fact that certain streptococci isolated from poliomyelitic brains may assume very minute forms similar to the globose bodies is not convincing proof of their specific concern in the etiology of human poliomyelitis. In fact the proof that globose bodies constitute the etiological agent is as yet inadequate.

On such a basis one can hardly hope for specific response in poliomyelitis by treatment with antistreptococcic serum.

TESTS OF THE SERUM FOR NEUTRALIZING POWER

Several years ago, we were allowed to test two different so-called antipoliomyelitic sera, one of Rosenow, the other of Nuzum & Willy. The method employed was based upon experiments carried out with human serum from convalescent cases of poliomyelitis. 2 cc. of normal horse serum were injected into the spinal canal of a normal monkey. The following morning, 50 cc. of virus filtrate were injected intravenously, and 2 cc. of human *convalescent* serum were injected intraspinaly. The intraspinal injection of convalescent serum was repeated daily for two days. "The monkey remained well." When normal human serum or horse serum was injected intraspinaly instead of convalescent human serum, experimental poliomyelitis resulted following the intravenous injection of the virus.

It was concluded that the convalescent serum neutralized the virus as it came through from the blood stream into more inti-

mate relation to the central nervous tissues and that serum from normal individuals or horses did not possess this power. Thus we had a simple though expensive method of testing serum. When the so-called antipoliomyelitic (antistreptococcic) serum was subjected to this test no neutralizing substances were found.

From this we concluded that the antipoliomyelitic or antistreptococcic serum of Rosenow and of Nuzum and Willy possessed no neutralizing power against poliomyelitic virus.

The monkey somewhat more resistant to the virus than human beings offers an excellent means for testing the efficiency of serum treatment and the results are no less definite than those obtained with guinea pigs in testing diphtheria antitoxin.

The evidence put forward by Rosenow is based on the treatment in human cases—a precarious foundation when more definite tests show the serum to be totally devoid of specific properties.

With our experience in experimental poliomyelitis we would *not* under any circumstances think of injecting horse serum intraspinally. We have shown repeatedly that such injections *increase* the damage and the susceptibility of monkeys. Curiously enough Rosenow now stresses the intravenous injection of his serum, shown to be *devoid* of neutralizing power. But it is not within the scope of this paper or in my experience to give any opinion on non-specific therapy in poliomyelitis.

(b) CAN A PRE-PARALYTIC DIAGNOSIS OF INFANTILE PARALYSIS BE MADE, AND IS THERE A SUCCESSFUL THERAPY?

GEORGE DRAPER

(*Abstract*)

It was pointed out that any effort to bring successful serum therapy to the cure of infantile paralysis depends upon the early diagnosis of the disease. Impression that the disease is primarily a paralytic one still occupies too important a position in the general understanding of the malady. Only about 15 per cent. of the total incidence of the malady develops paralysis. When paralysis has developed it is practically always too late to hope

for any specific arresting effects through serum therapy. Consequently, it is only by studying, diagnosing early and treating those individuals who make up the 85 per cent. of nonparalyzed cases that we can hope to protect those who are destined to make up the 15 per cent. of the paralyzed. It is possible to make a diagnosis of infantile paralysis in the pre-paralytic stage. The clinical picture differs in certain definite respects from that of most other acute infections in children. There is a peculiar expression in the eyes which suggests a frightened, bewildered animal. In addition to this look, which is well-recognized by those who have seen much of the acute stage of the disease, there is a well-known alternate irritability and somnolence with a snarling whine and irritable shrug of the shoulder. The resistance to anterior flexion of the spine because of the pain produced by this manoeuvre, is also very characteristic. This resistance is the cause of erroneously called Kernig's sign in the disease. The clinical pathological findings are also very helpful, the blood count showing a definite leucocytosis of from 15,000 to 25,000, with a definite increase in the polynuclear cells. The spinal fluid during this early stage of the disease is usually increased in quantity, somewhat increased in pressure, and contains more globulin than normal. The earliest appearance of cells is in the form of multi-lobed cells which rapidly change in a few hours to preponderating lymphocyte type.

It must not be forgotten that this disease should be classified preferably on a basis of the clinical picture of this early stage and not upon the distribution of the paralysis as has been formerly done. The disease may present a violent picture of acute infection which then subsides in one or two days with no subsequent developments. Or this preliminary phase may be followed by a few hours to a day or two apparent return to normal with a subsequent development of the meningeal aspect of the disease and paralysis, or with an almost unrecognized hour or two of slight temperature and malaise there may be immediate appearance of meningeal and paralytic symptoms.

So far as serum therapy is concerned, it can be said that the only serum which has definitely demonstrated its ability to neutralize the virus is the serum from patients who have recovered from the disease. There would seem to be enough evidence now

that if a sufficient quantity of such recovered serum is given to patients in the pre-paralytic stage paralysis may be prevented. The serum should be given in the following way: 10 to 15 cc. intraspinally after removal of sufficient amount of spinal fluid and 50 to 100 cc. intravenously immediately afterward. These intravenous doses should be repeated within six to eight hours. The suggestion is made that it should be just as easy to secure donors for this anti-polio serum just as quickly as one secures donors for blood transfusions.

This paper does not pretend to discuss in extenso the whole matter of serum therapy, except to say that it is difficult to understand why the Rosenow serum which has been proved non-specific for the virus of poliomyelitis should be of any value.

(c) THE ORTHOPEDIC TREATMENT OF INFANTILE PARALYSIS

FRED H. ALBEE

The care of infantile paralysis, because of the diversity of the problems presented, tests the mechanical ingenuity of the surgeon, not only in devising proper braces which vary within very wide limits, but also in devising and selecting proper operative treatment, which affords a wide range of possibilities—from the simplest operation, such as a subcutaneous tenotomy, to the most difficult bone transplantation. Probably no other one disease requires so many different types of operations for its satisfactory treatment. Briefly they may be enumerated as follows: tendon and muscle lengthening, tendon and muscle transplantations, insertion of fascial or silk or linen ligaments, nerve transplantations, neurotization of muscles, osteotomies to overcome contractures and distortions, plastic operations on joints to improve function, stabilizing operations, such as reefing the joint capsule or overlying soft parts, or arthrodesing of the joint itself, not to mention bone transplantation to correct deformities of the joints or spinal column, and the insertion of bone grafts to stabilize joints, or prevent the telescoping of ribs into the pelvis by placing a graft between the tenth rib and the rim of the pelvis. It is not my purpose to list or to discuss all the many

possibilities, for the orthopedic surgeon must ever be prepared to meet quickly and adequately unique individual problems, and to design at the moment suitable braces and operations.

There are three types of infantile paralysis: 1, the *abortive*, comprising those cases which have never become paralyzed; 2, the *cerebral*, those in which there is involvement of the upper motor neurone with resulting spastic paralysis; 3, the *bulbo-spinal*—by all means the largest group—in which are placed all cases in which the lower motor neurons are affected, with resultant flaccid paralyses. (Peabody, Draper, and Dochez's classification.)

The only objection to this classification is that the groups overlap. Cases are not always true to type, nor are the types always clearly defined. A case classified as bulbo-spinal may have brain foci; the cerebral case may have lesions extending into the cord.

The bulbo-spinal type is the one with which the orthopedic surgeon is chiefly concerned. This group is characterized by flaccid motor paralysis of the muscles supplied by the spinal nerves. The lumbar enlargement of the cord is the part chiefly affected, and hence paralysis of the lower limbs is more frequent than that of the upper. Involvement of the cervical swelling of the cord occurs less often, and consequently paralysis of the upper extremities is less frequent. The degree of the paralysis cannot be estimated by the severity of its onset.

Jahss has drawn some interesting conclusions regarding the distribution of paralysis from a clinical study of 400 cases of infantile paralysis during the great epidemic of 1916 in New York City—cases observed at the clinic of the Hospital for Joint Diseases. He found that in 78 per cent. of these cases there was some involvement of the lower extremities. Thirty-eight per cent. of the patients were paralyzed in one limb only, and of these, 10 per cent. in the upper extremity, and 28 per cent. in the lower. Twenty per cent. of the cases exhibited some form of paralysis of the trunk. The cranial nerves were affected in 13 per cent. of the cases, the seventh (facial) in the majority of the cases.

From the point of view of treatment, the disease may be considered as having *three stages*: the acute, convalescent, and chronic. The acute stage lasts from the onset of symptoms to

the disappearance of muscular tenderness and the cessation of abnormal temperature. The convalescent stage—a purely arbitrary consideration—extends from the end of the acute stage to such time as spontaneous improvement has apparently ceased. This period usually lasts about two years, after which the condition becomes chronic.

In general, the treatment of infantile paralysis may be outlined as follows:

During the acute stage, efforts should be directed to limiting the destructive physiological process by administration of serum, by symptomatic treatment, and by prevention of faulty posture, so far as possible. This stage is rarely seen by the surgeon, but he too often sees the unfortunate results of well-intended but meddlesome treatment, which over-anxious parents often press the general practitioner to undertake during this phase; as for example, massage and electricity which, though of undoubted value later, at this stage only serve further to stimulate an already over-stimulated nervous system. It should be constantly borne in mind that one is dealing with nerve lesions, and that a quiet environment, rest, and the avoidance of all nerve stimuli, such as excessive noise or light, are essential.

Joints will not become ankylosed, muscles will not hopelessly atrophy, and the patient will not become bed-ridden because he is kept quiet for a long a time as need be, to enable the damaged cord to repair without interference. This policy of doing nothing is trying to the parents who have heard of the wonders of massage and electricity, and are anxious that no time should be lost; and trying also even to the experienced surgeon when the tenderness is of unduly long duration.

The unsupported paralyzed foot in the acute stage, even if it does not become deformed, will surely lose power in the stretched muscles.

Certain deformities, most likely to occur, may be guarded against: 1—contracting the feet in plantar flexion, 2—flexion deformity of the knees, 3—flexion deformity of the hips, 4—adduction contraction of the shoulder, 5—lateral curvature of the spine.

The weight of the bed clothes, if not counteracted, often increases deformity; if the feet are in the equinus position because

of the paralysis of the anterior group, the weight of the bed clothes further exaggerates the equinus. Various means have been devised to relieve this weight. Lovett further suggested special arrangement of the bed, or the use of a special bed, to control the patient's restless movements, and support those muscles most likely to be paralyzed or overstretched, thus preventing undue deformity during this active stage.

During the convalescent stage, or period of spontaneous improvement, no operative procedure aiming at correction of muscle balance should be undertaken. The aim and object of treatment during this stage is to restore the greatest possible amount of efficiency to the inactive, atrophied muscles, and to prevent permanent deformity. A mental picture of the general pathologic process must be kept constantly in mind, in order that treatment may be intelligently managed. It must be remembered that the nerve centers controlling these muscles have, in a certain percentage of cases, been only temporarily inhibited in function by a hemorrhagic myelitis, with a consequent impairment of circulation and lowering of the general resistance.

The upright position of the patient should be assumed early unless involvement of spinal muscles prohibits, for recumbency favors sluggish circulation, whereas sitting and standing stimulate the muscles and nerve centers to restore "balance"; furthermore, recumbency and inaction have an untoward effect on the nervous system. A sitting posture, and as soon as is advisable, restricted walking, should be practised within two or three months after onset, with, however, great care to avoid fatigue. Outdoor air is, of course, best for the patient on general principles.

The supportive braceage or splintage treatment is always applied during the convalescent period to those cases in which it is necessary to support limbs or trunk, which would otherwise become distorted. As much care should be taken to avoid under-bracing as should be exercised against over-bracing.

If the abdominal and spinal muscles are too weak to support the torso, the patient should be propped in the chair with pillows. It is important to be on the lookout for scoliosis at this time, and the patient must be put in a position to counteract its development.

Abdominal paralysis is common, but may be overlooked. The physical signs are inability of the patient to rise from recumbency to a sitting position without assistance and when upright, protrusion of the abdomen with anterior or lateral flexion of the spine. The result, if uncorrected, is eversion of the costal borders from pressure against the protuberant abdomen, and this deformity may become structural. Unilateral abdominal paralysis is less common. The abdomen should be supported in such cases by a strong corset of heavy duck or other material with inserted supporting steel which may also favor recovery of function by the abdominal muscles.

BRACES

Even if the patient is able to walk unassisted, the weakened atrophied muscles are easily fatigued and are thereby injured; hence, the minimum amount of strain should be put upon them. If the patient cannot stand or walk without aid, or does so with the production of some deformity, *e.g.*, genu recurvatum, recourse must be had to braces, because it is imperative to get the muscles into use, at the same time supporting the limb and preventing the development of deformity. However, some patients, although extensively paralyzed in the legs, can manage to get about without assistance, and in such cases, unless some specific contra-indication exists, braces should be omitted.

Braces should be made as simple and light as possible, their sole purpose being to support the limbs and prevent recurrence of the deformity. This is of the greatest importance because in the growing period of a child's life its ligaments and capsules are easily over-stretched, thus permitting irreparable damage to the joints. The brace has to be devised to meet the requirements of the individual case at hand. There is no stereotyped brace that is applicable to all cases. In these days of so many infantile paralysis cases, we feel that it devolves upon us to emphasize the rule that the architecture of the brace should be draughted by the orthopedic surgeon for each individual. The brace should be light and as simple as possible, designed to afford the support lacking because of the paralyzed muscles, and should not interfere with the action of muscles capable of functioning.

For certain types of paralysis, *e.g.*, equinus, it should be made a general rule never to trust the shoe to support the foot. Leather can never be depended upon to withstand constant strain, for wetting causes it to yield, and therefore a foot plate of metal should be fastened to the brace.

The caliper splint, so frequently worn, wears out easily and causes much trouble, and its use is not favored by the author.

The *quadriceps extensor femoris* is one of the muscles most frequently paralyzed and is then the greatest hindrance to walking, because of flexion deformity of the knee. This should be prevented by a leather knee-cap attached to the upright of the brace.

In *gastrocnemius paralysis*, or even slight weakness of that muscle, the heels should be raised to prevent strain and stretching of the muscle by the superimposed body weight in walking. An elevation of the heel of a half to three-quarters of an inch in young children, and 1 to 1½ inches in older children, is necessary, while "bare foot" must be interdicted, even in undressing, and the use of sneakers and other heelless shoes absolutely forbidden, to avoid not only stretching of the gastrocnemius, but the production of permanent talipes calcaneus.

Objections to the use of apparatus are the extra weight and the muscular constriction caused by bands, lacings, etc., which hamper the already weakened muscles, but these objections are outweighed by the advantages gained. However, apparatus should not be worn except when actually required for walking, or to prevent deformity, and should be removed as often as possible.

The sense of equilibrium is often greatly impaired or lost by prolonged recumbency, and it is imperative to restore it before walking can be successfully accomplished. Loss of this sense must be reckoned with as a factor independent of the paralysis.

Patients with severe paralysis of the back, abdomen, and gluteal muscles require the support of a leather jacket with straps from the tops of the leg splints to the back of the jacket to act as substitutes for the gluteals and prevent flexion at the hips.

Fortunately the number of cases in which the loss of power consists only of muscular weakness, rather than of complete paralysis, comprise the vast majority of victims of the disease.

The active therapeutic measures of the convalescent stage aim at prevention of permanent deformity, and the restoration of nerve and muscle power. Massage, stretching of contracting muscles, and muscle training, are standbys in the therapeutics of this stage.

The *chronic stage* is marked by the cessation of spontaneous improvement. The lesions are stationary, and deformities and paralyses thoroughly established. When this stage has been reached, and the surgeon is truly convinced that a further return of muscle power is not possible, every case should be analyzed as to whether braces can be entirely eliminated, or can be diminished in their extent by some one of the operations above classified. This necessitates a very careful survey of the patient's musculature controlling each joint segment of the extremity, and consideration of the various operations which may be selected or designated to meet the particular conditions of the individual case. Meanwhile the full therapeutics of the convalescent stage are continued. It is at this chronic stage—about two years after onset—that the orthopedic surgeon many times sees these unfortunate patients for the first time.

The *examination* of such patients is important. First of all, the fear which so many children have of the doctor and the strange environment of his office, as well as their fear of pain during examination must be overcome. The surgeon must gain the confidence of his little patient, or the results of the examination will be valueless. In examining muscles, I have found it very helpful to designate their power by a scale of 0 to 4—4 indicating normal strength; 1, $\frac{1}{4}$ normal strength; and 0, nil, or complete paralysis. Taking the muscles of the foot for an example, we test the strength in flexion, extension, abduction, and adduction. If the plantar flexion is only one half normal, and the surgeon is confident that the child is applying all the force he can to that particular motion, he rates it as 2. The surgeon must make his own estimate, but comparison with normal muscles and normal joints on the opposite side aids materially in determining what constitutes "normal" strength for the individual in question. I repeat: examination should be delayed until the surgeon has the complete confidence of the child, in order that the muscle power may be estimated with accuracy.

I should like to speak here of the importance of muscles to joints—the whole usefulness of a joint depends on its proper control by the muscles attached. Further, it should be remembered that ligaments and capsules are weak and easily damaged in childhood. This is an important factor in treatment, for if these are properly supported until maturity, the joint will then stand a great deal of strain and abuse.

It will be evident from the foregoing discussion that *preventive treatment* is undertaken chiefly during the acute and convalescent stages of the disease. When the chronic stage is reached, we become concerned with *definitive* or *corrective treatment*.

Aside from the paralysis and the possibility of its surgical relief, the most important sequelae of the disease from the standpoint of the orthopedic surgeon are the deformities and contractures, and instability.

The question of the etiology of paralytic contractures has given rise to a multitude of theories and provoked keen controversy. In general, a contracture is due, not as is so often erroneously believed, to shortening of the paralyzed, but to overactivity of the healthy muscle group antagonistic in action to the paralyzed muscle group. "The normal position of a joint in the living body is determined and maintained by the equilibrium existing between the various muscles surrounding the joint—brought about by the elastic tension of the muscles and tendons—also by muscle tone" (Vulpian). Or, in other words, structural shortening occurs because, in the growing period of the child's life, the tonicity and elasticity of normally innervated muscles cause them to remain permanently in a shortened state in the absence (paralysis) of that stress normally brought to bear upon them by antagonistic normal muscle. This structural shortening is secondary to the contraction following unopposed muscle-pull. It should be noted that underlying all is the physiological property of soft tissue always to "take up slack" during the growing period.

Total paralysis of a limb is followed by relaxation of the joint capsule and a flail-like condition of the joints of the limb. If malposition of the limb is maintained for any length of time, shortening occurs in those enervated muscles whose points of

attachment have been approximated, and deformity of the limb accompanies these changes. The more extensive the paralysis the more severe the capsular relaxation, so that in children subluxation or even complete dislocation may occur.

Hypertrophy of the surviving muscles of a paralyzed limb almost universally occurs, and is a functional compensatory hypertrophy, *e.g.*, of the extensor longus hallucis for the paralyzed tibialis anticus; of the sartorius for the paralyzed quadriceps extensor femoris. Furthermore, compensatory hypertrophy occurs in the sound limb in unilateral paralysis, and the muscles of the arms are similarly affected in cases of paraplegia in which the arms are used as an aid in locomotion.

PREVENTION OF PERMANENT DEFORMITY

Permanent deformity is nearly always preventable, and its existence is usually an indication of neglect or ill-advised treatment on the part of those having had charge of the patient, particularly in the case of deformities of the feet. Deformity resulting from paralysis of the spinal and shoulder muscles is, of course, a different matter, and permanent deformity may be unavoidable in such instances.

There are three stages in the development of deformity: (1) sustained malposition, which is remediable without the use of force; (2) lengthening of the soft parts on the stretched side of the joint, with shortening on the other side. In exceptional cases, the joint remains flail-like; (3) permanent structural bony and ligamentous deformity, due to adaptation of the growing bone to the vicious position. Gravity or weight-bearing may produce further deformity in a flaccid extremity. Unopposed muscle pull is also a factor.

OPERATIVE TREATMENT

Operative treatment is designed to accomplish three purposes: (1) correction of fixed deformity, (2) stabilization, and (3) improvement of muscle function. Sometimes one operation will serve all purposes, but occasionally deformity is so serious that its entire correction must first be accomplished, and improvement of muscle function by transplantation deferred until a later operation. A transplanted muscle should never be required to

correct or maintain correction of a deformity. In fact, the anatomical architectural plans of the surgeon should be such, if possible, that the transferred muscle will function under more favorable mechanical conditions even than the muscle for which it was transplanted. This may involve stabilizing joints or changing relationship of bony skeleton by arthrodesis, silk or fascial ligaments, bone transplantation, etc.

The scope of this paper will not begin to allow detailed mention of all operations which can be approved of in the proper management of infantile paralysis. Therefore only the most striking, most recent, and those most far-reaching in their influence upon the return of function, or presenting peculiar technical difficulties will be discussed.

PREPARATION OF THE FIELD OF OPERATION

The patient should be admitted to the hospital at least 24 hours before the operation. Immediately upon admission a generous field of operation is shaved, and cleansed with benzine. Then a generous coat of $3\frac{1}{2}$ per cent. tincture of iodine is applied, over which a sterile dressing is placed. Just before operation this is removed, and a second coat of $3\frac{1}{2}$ per cent. tincture of iodine is applied. For children under two years of age, the tincture of iodine is diluted with an equal amount of alcohol, otherwise the preparation is the same.

After the patient is under anaesthesia, a tourniquet is applied if necessary, and a generous skin incision and approach to the field of operation made. Irritation of muscles or tendons by prolonged exposure to air is avoided by keeping them constantly moistened with saline solution.

OPERATIONS

The following few operations, one for each joint segment, are chosen mainly to illustrate fundamentals, and no attempt has been made to cover all approved operative procedures for infantile paralysis, as time will not permit.

OPERATIONS ON THE FOOT

Paralytic talipes valgus. Transplantation of peroneus longus and maintenance of correction of deformity by arthrodesis of the

astragalo-scaphoid joint. One of the most troublesome cases from paralysis of one muscle is that of the anterior tibial developing into an extreme talipes valgus deformity. This is a most disabling one, owing to the weakness and distressing symptoms which follow in the foot.

Fortunately there is no weakness or distortion produced by infantile paralysis that is more satisfactorily relieved by surgical measures than this. And further there is nothing in the whole realm of orthopedic surgery which illustrates in a more pronounced way the necessity of devising and modifying operations to meet fully the mechanical defects present in the individual case.

Reasoning *a priori*, since the anterior tibial muscle is paralyzed or weakened, it might seem sufficient to the uninitiated merely to substitute the perineus longus, or the perineus longus and brevis, for the paralyzed anterior tibial muscle. But this is not the case, in that the very distortion following the weight bearing use of the foot with the tibialis anticus paralyzed is such that, when muscles are transplanted to take the place of the paralyzed one, they may tend to pull the foot into a more pronounced valgus rather than to correct the deformity. In other words, the distortion of the foot influences the direction of the pull to such a degree that, following the transplantation, it comes on the outside of the mechanical center of the midtarsal joints, rather than on the inside. It thus devolves upon the surgeon not only to correct, but to provide for the maintenance of the correction of the bony deformity at the same time that the muscle is transplanted. This can be done by the arthrodesis of the astragalo-scaphoid joint with the foot over corrected of its valgus and abduction. You will recall that the dorsal and plantar flexion of the foot and ankle comes almost wholly at the astragalo-tibial joint, and that here is very little lateral motion at this joint. On the other hand, the lateral motion of the midtarsal region of the foot comes almost wholly at the astragalo-scaphoid joint, and it is at the expense of this joint that the valgus deformity has occurred. Therefore, with the astragalo-tibial joint stable as to lateral motion, the arthrodesis of the astragalo-scaphoid joint holds the forefoot stably corrected in the adductor position with the arch also corrected. Because of the already existing laxity

of this joint and its increase by the removal of the articulating cartilage from both bones at operation, it is wise in many instances to peg the two bones together with a bone graft, according to a method recommended by Ogilvy.

Mayer and Biesalski have made a worth-while contribution to orthopedic surgery by utilizing the tendon sheath of the paralyzed muscle as a physiological path for the transplanted tendon or tendons. Thus, in case of paralysis of the tibialis anticus muscle, the perineus longus tendon is drawn to its new point of insertion through the sheath of the paralyzed tendon. Their experiments prove that a tendon transplanted by this new technic glides in its new bed with the same freedom as a tendon normally does. In other words, post-operative adhesions are entirely avoided by this new procedure. In all other instances, the subcutaneous tissues should be sufficiently tunneled to receive the transplanted muscle readily, and in a perfectly straight line.

METHOD OF INSERTING A TENDON

It is always preferable to transplant bone in the tendon end, and inlay this bone under trap doors of the periosteum and bone. If it is impossible to secure bone in the end of the transplanted tendon, the tendon end should be, whenever possible, anchored beneath bone. The transplantation of a tendon into a slit in another tendon is permissible, but not advisable, and should be avoided when possible. Bone tissue is specialized to withstand stress, and therefore when it is used to anchor tendons it proliferates under the influence of stress, precisely as it does when bony elements are actually coapted in a fracture or after a bone graft operation.

The tendon is anchored with No. 1 chromic catgut, or fine Kangaroo tendon. In some instances the transferred tendon may be sutured to the tendon it is functionally to replace, or some other tendon, and not seriously change its line of pull. These sutures may be absorbable and temporarily withstand all stress which might dislodge the tendon end from its implantation. Such is the case in the transplantation of the perineus longus or extensor proprius hallucis; the transplanted tendon is sutured firmly to the side of the anterior tibial tendon.

The fascia and soft parts are closed with O Chromic catgut continuous suture, and the skin is approximated by O catgut in continuous suture. *The line of suture* is then very carefully puddled with 3½ per cent. tincture of iodine until every suture hole and the line of incision is thoroughly impregnated. From a long study of wounds incased in plaster of Paris casts for many weeks immediately following operation, the speaker is thoroughly convinced that there is danger from latent bacteria in the deep layers of the skin, and therefore he has inaugurated this so-called puddling of the suture holes and the edge of the skin, so that a film of tincture of iodine will remain upon the skin edges as well as in the suture holes while the dressing is applied, prior to the application of the plaster of Paris splint. This technic has been employed upwards of ten years with the greatest satisfaction, in all skin wounds associated with bone graft operations, tendon transplantations, and wherever long continued plaster of Paris dressings are necessary.

The plaster splint is taken off 3 to 4 weeks after the tendon transplantation operation. Its removal is immediately followed by massage, muscle training, and temporary braceage. The latter is almost always necessary, and should be very much emphasized, as a recently transplanted tendon is very likely to become over-fatigued if it is required to function in controlling a joint as well as in bearing weight. This is especially true in case of the foot. Of course it should be realized that in certain cases it may be necessary to apply some permanent braceage; in any event the amount should be much diminished as a result of the operative procedure.

Surgery of the infantile foot cannot be passed over without mention of the epoch making work of Whitman and Hoke.

OPERATIONS ON THE KNEE

In the event of the complete paralysis or near paralysis of the quadriceps group, with the hamstring tendons intact, transplantation of the biceps femoris muscle affords very favorable results: 1—because the knee joint is a hinge joint, having motion in one plane, and 2—because the origin, insertion, and length of the biceps femoris muscle are favorable to transplantation into the upper outer corner of the patella.

The fundamental considerations in all tendon and muscle transplantations is especially emphasized in this instance, in that the muscle, without traumatizing its surface, be carefully freed by sharp dissection sufficiently far up, so that when inserted into the patella, it will pull in the straightest line possible.

The transference of this muscle also illustrates the cerebral re-education and control of a muscle to function in an entirely different way. Instead of a pure flexor, it becomes a pure extensor of the knee joint. This fact was a mooted one with the profession for a number of years, but has now become most thoroughly established by extensive repetition of the tendon transplantation by a very large number of orthopedic surgeons. One point in technic is important—the tension upon the transplanted tendon and muscle should be zero when the origin and insertion of the muscle are separated.

OPERATIONS UPON THE HIP

Paralytic dislocation of the hip. For this most unfortunate condition an open operation is done which illustrates the great advantage of the plastic bone and joint technic. The hip is first reduced—this is easily accomplished. The acetabulum, the depth of which has been diminished by the wearing away of its rim as a result of friction from the constant slipping in and out of the head of the femur, is deepened artificially, as follows: The rim of the acetabulum is severed just outside and around attachment of capsule throughout its whole upper half circumference, then displaced outward, and a graft taken from just below the anterior superior spine of the ilium, is placed behind it. The capsule is then reefed with silk and medium Kangaroo sutures. This procedure deepens the acetabulum to beyond its normal depth. See Figures 1 and 2.

The Smith-Peterson approach to the hip is used.

A free exposure of the superior, anterior, and posterior portions of the capsule of the joint is given, together with its attachment to the acetabular rim; the posterior portion of the capsule is seen and felt to be lax, if the head is in the acetabulum, and if the head of the femur is disarticulated, it distends the capsule by pressure from beneath, and further displacement of the head is resisted. Upon manipulation of the femur, the head

is readily felt as a rounded hard surface, slipping about beneath the capsule.

The amount of deficiency of the acetabular rim can be very easily determined at this stage by direct palpation, and manipulation of the head. Above the capsular attachment of the acetabular rim, the bone surface is cleared of soft tissue, and with a narrow thin osteotome the bone is incised just outside of the insertion of the capsule in a semicircular line over the posterior-superior-anterior aspect of joint. This curved acetabular bone segment is then pried downward and outward with the osteotome to deepen the acetabulum. The prying downward and outward of this curved superior bony rim segment produces still more laxity and wrinkling of the attached portion of the capsular ligament. The slack is taken up by reefing this portion of the capsule by a row of mattress sutures of kangaroo tendon placed obliquely to the long axis of the neck of the femur. The stitches are so placed as to make the reef of the capsule lie equidistant from the two ends of the capsular bone insertions. This takes up the slack of the capsule, and at the same time helps to hold the new formed acetabular rim in position.

After the rim of the acetabulum has been depressed, one or two small wedge-shaped portions of the upper surface of the gap are removed with a sharp osteotome, and into these are inserted the bevelled ends of short bone grafts. The other ends of these grafts rest on the depressed portion of the acetabular rim, thus producing permanent overhanging of the latter. When such grafts have been inserted, the more pressure is exerted on the rim of the acetabulum from muscle spasm or weight-bearing, the more firmly are the grafts and the new rim of the acetabulum held in place.

Arthrodesis of the hip. In the event of flail joints or complete paralysis, two joints are most favorable to arthrodesis—the hip and the shoulder. In both joints, bone grafts are very advantageous in aiding to secure immediate arthrodesis. The type of technic is extremely essential in obtaining the desired results. Every surgeon must realize that the operation for arthrodesis, even in non-pathological joints, must be performed with meticulous care, both as to design and execution of the technic.

The speaker was the first to design an arthrodesis operation for the hip, and published this in the J. A. M. A. in June, 1908. This consisted of the careful morticing of the head of the femur into the acetabulum. It was found, however, after the extensive use of this operation, that there were about 10 per cent. delayed unions, and about 5 per cent. non-unions. Therefore the operation was modified by sliding a broad graft from the outer table of the ilium down in contact with the overlying outer surface of the neck of the femur, which was split to receive the lower end of the graft as an inlay. This graft in the adult is used for all arthrodesis operations of the hip joint, and is approximately $1\frac{1}{2}$ inches wide and $2\frac{1}{2}$ inches long. If this technic is properly followed, a bony ankylosis will be secured in at least 98 per cent. of cases.

A prominent orthopedic surgeon has recently stated that he personally is unable to get more than 50 per cent. of ankylosis from arthrodesis without a bone graft. This merely emphasizes the necessity for unfailing attention to design and technique in such operations—a point which I have already stressed. We must remember that we are working counter to Nature's powerful efforts to perpetuate or restore the natural function of a joint—*motion*.

In the case of a flail joint at the hip, an arthrodesis furnishes a very serviceable limb, and cannot be too highly praised. There is considerable motion of the pelvis in relation to the trunk, controlled by strong muscles, therefore a fusion at the hip with the femur in proper relation to the pelvis brings about not only very satisfactory motion by virtue of compensatory motion at the lumbar spine but may bring about as much as two inches of practical lengthening in a shorter limb from delayed growth.

OPERATIONS ON THE SHOULDER

At the shoulder, the same type of operation, with careful attention to the posture, gives even more brilliant results than at the hip, in that by arthrodesing the shoulder joint with the humerus anterior elevated and the hand in front of the face, while the scapula is flat against the thoracic wall, a very potent compensatory function is secured by virtue of the extensive range of motion of the scapula upon the thorax. If the scapula-

thoracic muscles are intact, the function following such an operation is very surprising to patient and family, providing the muscles controlling the elbow and hand are also intact. For the helpless flail extremity, hanging limp from the shoulder, is transformed into one that is very satisfactorily controlled by the powerful scapulo-thoracic muscles.

The *technic* of arthrodesis in this joint I believe to be even more important than in the hip joint. "Beginning just internal to the acromioclavicular joint, a vertical incision is made downward to the outer side of the pectorodeltoid groove. The capsule is incised along the bicipital groove, and the synovia excised as thoroughly as possible, and any remaining is curetted away. Dislocate the head from the glenoid by sharp external rotation of the humerus. All cartilage is removed from the head and glenoid by osteotome or gouge, and from the approximating surface of the acromion process. While the scapula is held in good position by an assistant, return the head to the glenoid cavity and in close contact with the acromion process. With the arm held in slight internal rotation, elevated anteriorly at right angles to the body, and slight flexion at the shoulder (in such a position that by flexing the forearm the patient can touch mouth, head and neck), a bone graft peg is driven into the head of the humerus, through the acromion process. This latter procedure retains the position, increases fixation, and hastens bony union. The capsule is reefed to take up the slack and improve immediate immobilization. The arm and shoulder are fixed in the desired position in plaster of Paris, which immobilization is maintained for at least ten weeks."

This technic was first described by the speaker in a monograph entitled "Bone Graft Surgery," in 1917.

In controlling the patient during this operation upon the shoulder and also the arthrodesis upon the hip, it is almost imperative that the surgeon have the benefit of the Albee fracture orthopedic operating table, in order to control the posture of the extremity and the trunk during the operation, and during the post-operative immobilization by plaster of Paris splintage. (The Albee table is specified because there is no other which allows the upper extremity to be held in such postures during and after operation.)

OPERATIONS UPON THE SPINE

I believe there is no more unfortunate deformity following infantile paralysis than the extreme case of paralytic scoliosis, and no condition is more unfavorable to treatment by conservative braceage. The spine takes the letter S curve. Both the thorax and the abdominal viscera are compressed, and discomfort and pain are caused in the more severe cases by the impingement of the lower ribs, as they telescope inside the pelvis.

In all cases of scoliosis we find primary and compensatory curves. The correction of the primary curve has a very material and direct corrective influence upon its compensatory curves. Therefore, in the case of paralytic scoliosis, correction of distortion and ankylosis by graft or fusion of the vertebrae, which make up most or all of the primary curve, has a very potent influence in diminishing the compensatory curves.

Here again plastic surgery has enabled the surgeon to do what was hitherto impossible for these most unfortunate cases. The bone graft is put in in a manner slightly different from that used in the speaker's operation for cases of anterior-posterior kyphoses, such as those observed in Pott's disease. In cases of paralytic scoliosis, the same mechanical principle is applied, but the graft is so placed that the deforming influence which acts laterally comes upon the graft edgewise. In other words, speaking figuratively, the graft is inserted into the spinous processes flatwise.

The following case is most illustrative of what can be done for these unfortunates by means of plastic bone surgery.

The patient, a man aged 20, as a result of infantile paralysis had a marked scoliosis of the type just described, with telescoping of the ribs, and also complete paralysis of the right quadriceps group of the right leg. It was thought that operative intervention had a much better chance of success by transplanting the right biceps forward for the quadriceps group, and therefore he was admitted to the Post Graduate Hospital, and the operation carried out as we have already described under transplantation operations.

A year later the patient returned to me, and was so much pleased with the improved function in his right leg following

the operation, that he begged to have his spine operated upon. Therefore he was again admitted to Post Graduate Hospital, and was placed in the dorsal position upon a gas-pipe frame especially designed for him, and lateral corrective tension applied constantly for a period of two weeks. This constant stretching straightened the spine very materially, and the author's regular operation for Pott's disease was then done, with the variation in the placement of the graft already referred to. In other words, the spinous processes of the lower dorsal and lumbar vertebrae were split, and a graft inserted flatwise into these processes, using the graft as a lever to still further increase the correction of the scoliotic deformity. Fig. 3.

It was then found that, because of the extreme amount of lateral deviation at the lumbosacral junction, the floating ribs were still riding at about the level of the iliac crest; and fearful that relief from the pain of the telescoping of the ribs would not be complete, it was decided to put in a graft as a prop between the rim of the pelvis and the anterior end of the 10th rib.

A longitudinal incision through the skin and subcutaneous tissue was made from about $1\frac{1}{2}$ inches back of the anterior end of the 10th rib, directly downward to the crest of the ilium. The ribs were then by strenuous lateral tension forced above the crest of the ilium as far as possible. A measure was then taken of the distance between the rim of the pelvis and the rib; this was found to be about 6 inches. The rib was mortised as well as the ilium, to receive the tibial graft properly. The wound was packed with hot saline, and the anterior internal surface of the right tibia was exposed for a distance of about 8 inches. A graft 6 inches long and $\frac{1}{2}$ inch wide was removed by means of the twin motor saw, and the central portion of the anterior internal surface, including the complete thickness of the cortex of the bone with its periosteum, and as much marrow as would cling thereto. The ends of the graft were then notched by removing a triangular piece of bone from each end. The pack was removed from the olio-thoracic wound, and by means of elevating the ribs as far as possible from the crest of the ilium, the notched ends of the graft were inserted into the mortices already prepared for it. These ends were firmly held in place by sutures of medium Kangaroo tendon placed in the bones and

the periosteous structures at either end. Both wounds were closed in the usual way.

With the patient still in the ventral position on the Albee Fracture-Orthopedic operating table, a plaster of Paris jacket was applied from the base of the skull and well under the arms to below the crest of the ilium. This was specially molded during the hardening period, so that it acted as an overcorrecting influence on the lateral deformity of the trunk.

The patient made an uneventful recovery, and has been one of the most successful cases I have ever had the privilege to operate upon. This operation was done in January, 1923, so that I can speak with confidence of the results.

I have purposely said very little about muscle training, for this is a subject meriting a paper by itself. It is one of the great assets in the armamentarium of the orthopedic surgeon, both preoperatively and postoperatively, as well as in cases in which operation is not indicated. Muscles that have been weakened or have been temporarily paralyzed, with subsequent return of power are in many instances not properly controlled, and the child is unable to contract them fully at will. This emphasizes the necessity for muscle training in all cases. There is one striking difference between pre- and post-operative muscle training: the former develops individual muscle power; the latter educates the brain to make the transplanted muscle function in an entirely different way.

I should like to leave you with a picture of nearly 600 muscles with all types and variations of paralysis and weakening, reflecting a corresponding variety of distortions on the skeleton; for extremity and trunk postures are wholly dependent upon muscle balance. It is evident, with such a picture in mind, that the braceage, muscle training, and operative management of infantile paralysis cannot be stereotyped. No two cases are alike, and the orthopedic surgeon must not only be a good technician, but a mechanical genius, ready at a moment to devise mechanical apparatus or reconstruction operations as called for by the conditions in the individual case.

OPENING OF THE NEW BUILDING

Progress on the new building continues satisfactorily and it is confidently expected that it will be ready for occupancy in October.

The moving of the Library began early in August and should be completed the first week in September, but the Library will not be in running order until the opening of the new building. The Council regrets deeply the closing of the Library over so long a period but it is unavoidable.

OPENING CEREMONIES

The new building will be formally opened on Tuesday afternoon, October 19, when there will be several addresses and inspection of the building by the Fellows and their friends followed by a reception.

It is planned to have a dinner at the Hotel Commodore on the same evening in honor of the newly elected Honorary Fellows, many of whom will be present. Special notices of this dinner will be sent to the Fellows the last of September. On Thursday evening, October 21, the first stated meeting will be held in the new building.

Papers will be read by Professor Charles James Martin, of Cambridge, England, and Professor Friedrich Müller, of Munich.

RECENT ACCESSIONS TO THE LIBRARY

Aimes, A. *La pratique de l'héliothérapie*. 4. éd.

Paris. Maloine, 1925, 256 p.

American child health association. Report of the Chicago health education conference . . . June 22-26, 1925.

N. Y. Am. child health asso. [1926] 357 p.

American medical association. *New and nonofficial remedies*, 1926.

Chic. A. M. A., 1926, 459 p.

Austin, J. H., & Cullen, G. E. *Hydrogen ion concentration of the blood*.

Balt. Williams, 1926, 75 p.

Barnes, H. E. *The repression of crime*.

N. Y. Doran, 1926, 382 p.

Bassler, A. *Disease of the stomach*. 6. ed.

Phila. Davis, 1926, 1007 p.

- de Beer, G. R. The comparative anatomy, histology and development of the pituitary body.
Edinb. Oliver, 1926, 108 p.
- Begg, C. Sprue.
Bristol. Wright, 1926, 128 p.
- Bose, Sir J. C. The nervous mechanism of plants
Lond. Longmans, 1926, 224 p.
- Brundage, A. H. A manual of toxicology. 15. ed.
N. Y. Appleton, 1926, 444 p.
- Bulletin no. IX of the International association of medical museums. . . . Sir William Osler memorial number.
Montreal. Priv. printed, 1926, 633 p.
- Cameron, H. C. Diseases of children.
Lond. Oxford pr., 1926, 199 p.
- Cokkinis, A. J. Mesenteric vascular occlusion.
N. Y. Wood, 1926, 159 p.
- Coleman, F. Materia medica for dentists. 6. ed.
Lond. Oxford pr., 1926, 345 p.
- Craig, Sir M., & Beaton, T. Psychological medicine. 4. ed.
Phila. Blakiston, 1926, 437 p.
- Creswell, C. H. The Royal college of surgeons of Edinburgh. Historical notes from 1505 to 1905.
Edinb. Oliver, 1926, 315 p.
- Cummer, C. L. A manual of clinical laboratory methods. 2. ed.
Phila. Lea, 1926, 547 p.
- Cushny, A. R. Biological relations of optically isomeric substances.
Balt. Williams, 1926, 80 p.
- Elias, H., & Feller, A. Strauungstypen bei Kreislaufstörungen.
Wien. Springer, 1926, 232 p.
- Ellis, A. G. Elements of pathology.
Phila. Blakiston, 1926, 544 p.
- Evans, F. A. Pernicious anemia.
Balt. Williams, 1926, 178 p.
- Fano, G. Brain and heart.
Lond. Oxford pr., 1926, 142 p.
- Foix, C., & Nicolesco, J. Anatomie cérébrale.
Paris. Masson, 1925, 581 p.
- Gates, G. The mechanism and meaning of life.
N. Y. Hitchcock, 1925, 59 p.

Handbuch der normalen und pathologischen Physiologie, Hrsg. von A. Belhe [et al.] Bd. 14. Hft. 1. Fortpflanzung, Entwicklung und Wachstum.

Berlin. Springer, 1926, 1193 p.

d'Herelle, F. The bacteriophage.

Lond. Baillière, 1926, 629 p.

Hernaman-Johnson, F. Radiotherapy in relation to general medicine.

Lond. Oxford pr., 1926, 211 p.

Hevesy, G., & Paneth, F. A manual of radioactivity.

Lond. Oxford pr., 1926, 252 p.

Hewlett, R. T. A manual of bacteriology. 8. ed.

Lond. Churchill, 1926, 645 p.

Home, H. The engineer and the prevention of malaria.

Lond. Chapman, 1926, 176 p.

Hope, E., & Stallybrass, C. O. Text-book of public health. 9. ed.

Edinb. Livingstone, 1926, 340 p.

Johnson, C. B. Sixty years in medical harness, 1865-1925.

N. Y. Med. life pr., 1926, 333 p.

King, J. J. Local anesthesia in otolaryngology and rhinology.

N. Y. Hoeber, 1926, 205 p.

Kylin, E. Die Hypertoniekrankheiten.

Berlin. Springer, 1926, 168 p.

Laird, J. Our minds and their bodies.

Lond. Oxford pr., 1925, 122 p.

McKenzie, T. C., & King, A. A. Practical ultra-violet light-therapy.

Lond. Benn, 1926, 108 p.

Macleod, J. J. R. Carbohydrate metabolism and insulin.

Lond. Longmans, 1926, 357 p.

Mayes, H. G. Keeping fit.

Lond. Harrap, 1926, 60 p.

Morse, J. L. Clinical pediatrics.

Phila. Saunders, 1926, 848 p.

Pinch, A. E. H. A manual of technique in radium therapy.

Lond. Radium inst., 1926, 41 p.

Rubino, A. Semiotica medica. 4. ed.

Milano. Vallardi, 1926, 546 p.

- Sadler, W. S. Constipation.
Chic. McClurg, 1925, 296 p.
- Sajous, C. E. deM. Strength of religion as shown by science.
Phila. Davis, 1926, 252 p.
- Savage, G. C. Ophthalmic neuro-myology. 2. ed.
N. Y. Author, 1926, 227 p.
- Schalek, A. Fundamentals of dermatology.
Phila. Lea, 1926, 239 p.
- Schindler, K. Die Konstitution als Faktor in der Pathologie und Therapie der Syphilis.
Berlin. Karger, 1925, 120 p.
- Schmidt, J. A text-book of organic chemistry.
Lond. Gurney, 1926, 798 p.
- Scott, G. D. Normal backwardness and balance in child life.
Bost. Badger, 1926, 132 p.
- Simmons, G. H., & Fishbein, M. The art and practice of medical writing.
Chic. A. M. A., 1925, 163 p.
- Stutsman, J. O. Curing the criminal.
N. Y. Macmillan, 1926, 419 p.
- Taylor, E. W. Psychotherapy.
Cambridge. Harvard pr., 1926, 52 p.
- Thomson, Sir St. C. Diseases of the nose and throat. 3. ed.
N. Y. Appleton, 1926, 943 p.
- Troland, L. T. The mystery of mind.
N. Y. Van Nostrand, 1926, 253 p.
- U. S. P. H. Service. Venereal disease manual.
Wash. Gov. pr., 1926, 67 p.
- Walsh, J. J. Our American Cardinals.
N. Y. Appleton, 1926, 352 p.
- Walsh, W. T. Scientific spiritual healing.
Lond. Appleton, 1926, 179 p.
- Wilder, H. H. The pedigree of the human race.
N. Y. Holt, 1926, 368 p.
- Wilson, S. A. K. Aphasia.
Lond. Kegan Paul . . . 1926, 108 p.
- Wood, H. C., jr., & LaWall, C. H. The dispensatory of the United States of America. 21. ed.
Phila. Lippincott, 1926, 1792 p.

THE COMMITTEE ON PUBLIC HEALTH RELATIONS

SUMMARY REPORT ON SEGREGATED CLASSES FOR CARDIAC CHILDREN IN THE PUBLIC SCHOOLS

1. THE PROBLEM OF THE SCHOOL CHILD WITH HEART DISEASE

According to the findings of school medical inspection in this city, 14 out of every 1,000 school children suffer from some kind of heart defect. A more complete clinical examination of a large number of school children established the incidence of actual organic heart disease to be about 7 in 1,000 in the elementary schools of New York City.

The classification of cardiac children adopted by the New York Heart Association is based on the functional ability of the heart to withstand the physical strains of every day tasks. In addition to the groups designated as having possible and potential heart disease, there are three classes of organic heart defects: those in Class I have practically normal physical capacity; Class IIA comprise those which have only slightly diminished physical capacity; Class IIB with very little cardiac reserve power; and Class III with no reserve. Class IIB and III children all have some degree of heart failure, but the determining causes of heart failure in adults and children are in the vast majority of cases entirely different. Heart failure in adults is the result of dynamic changes in the circulation. In children acute infection, usually rheumatic, involving the endocardium and the myocardium, and at times the pericardium, accompanies and is the exciting cause of the heart failure. With subsidence of the underlying infectious process, the child passes through a period of convalescence to almost perfect compensation, graduating into Class IIA and even to Class I where he is able to carry on the ordinary activities of childhood.

At times children apparently in Class IIA have a mild but nevertheless actively infectious heart disease which may escape detection for the time being because there is little evidence of their reduced ability to perform work. All these children with active heart disease are sick children and should be in bed, no matter what their physical ability to perform work.

Children who have had active heart disease within a period of several months to a year, or even more, are likely subjects for a reinfection or recrudescence of a smouldering infection. In addition, children with potential heart disease may at any time develop active heart disease.

Numerically, Class I comprises the largest group of cardiopathic children (55 per cent.). Class IIA includes 37 per cent. of the children, Class IIB, 7 per cent., and Class III, 1 per cent. There is a small group of cases which are designated as borderline cases between Class IIA and Class IIB. The children in this group do not fit definitely into either classification. The majority of these children, by removal of focal infections, by attention to nutritional disturbances, by residence for several weeks in cardiac homes in the country, improve steadily and can be placed very definitely in Class IIA. The minority becomes worse, being placed in Class IIB and Class III, requiring bed treatment. There is a small remainder, about 3 per cent. of all cardiac children, who remain *in statu quo*.

2. NEED OF ADEQUATE MEDICAL SUPERVISION

It is because of the peculiar character of heart disease in children that expert medical supervision is required. There is need of watching over these children continuously with a view of prescribing exercise and re-classification. The children must be followed up in their homes with a view of educating the parents to the importance of enforcing the prescribed routine.

The segregation of cardiopathic children in special classes as has been done by the Department of Education of this city has been found unsatisfactory by the New York Heart Association. The Association pointed out that:

(a) With a slight change in the daily routine of cardiopathic children, there is no need of segregation of children classified as I and IIA, and children in Class IIB and Class III are too sick to attend school; and

(b) The small number of children in the borderline group requiring rest periods or special lunches could be accommodated in the existing classes for handicapped children.

Because of the existing difference of opinion between the Heart Association, on one hand, and some members of the admin-

istrative staff of the Department of Education and certain clinic physicians, on the other, the Committee on Public Health Relations was asked by the Superintendent of Schools to submit conclusions and recommendations concerning the problem.

3. CONCLUSIONS OF THE INQUIRY MADE BY THE COMMITTEE ON PUBLIC HEALTH RELATIONS

After conferences with every one concerned in the matter, the Committee on Public Health Relations came to the following conclusions with regard to the problem:

(a) That the expansion of the segregated classes on the part of the Department of Education has not been warranted during the period of the demonstration and particularly since the report of the demonstration has been submitted;

(b) That those responsible for the segregated classes in the Board of Education evidently do not appreciate that segregated classes *per se* are not the aim but afford a method of medical control and supervision. They are satisfied that what is needed is not strict medical supervision but merely medical advice, and their chief interest lies quite naturally more in the educational than in the health problem;

(c) That segregated classes under strict medical supervision have certain administrative and perhaps educational advantages, but in view of the best medical evidence they are of no value to the children insofar as the cardiac condition is concerned;

(d) That only a small number of existing segregated classes have adequate medical supervision, including the nursing and follow-up service indispensable to the supervision of children and the education of parents;

(e) That the selection of children is adequate in schools which are properly supervised from the medical point of view. In the other classes, the selection has been on a haphazard basis;

(f) That the immediate discontinuance of all the unsupervised segregated classes would be desirable; and

(g) That the plan of supervision by the Bureau of Child Hygiene of the Department of Health as recommended by the Heart Association is a practical measure, and if adequately carried out would afford a supervisory service for all children with cardiac defects allowed to attend school.

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TABLE OF CONTENTS

Editorial:

Bacon's relation to medicine: FIELDING H. GARRISON	449
--	-----

Papers presented at the Stated Meeting of May 20th:

A symposium on poliomyelitis.

a. Is epidemic poliomyelitis preventable and does a specific form of treatment of the disease exist? HAROLD AMOSS	456
b. Can a pre-paralytic diagnosis of infantile paralysis be made, and is there a successful specific therapy? GEORGE DRAPER	461
c. The orthopedic treatment of poliomyelitis. FRED H. ALBEE	463

Announcement:

Opening of the new building	483
-----------------------------------	-----

Library Notes:

Recent accessions	483
-------------------------	-----

Committee on Public Health Relations:

Summary report on cardiac children	487
--	-----

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THE NEW YORK ACADEMY OF MEDICINE

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AUGUST, 1926

No. 8

EDITORIAL

LAENNEC

The centenary of Laennec's birthday fell on February 17, 1881. In 1919, the centenary of his invention of the stethoscope and of the publication of his treatise on mediate auscultation was celebrated with great eclat. He died one hundred years ago, on August 14, 1826.

He was a native of Quimper (Brittany), and came of an old Celtic family, the name of which ("Lennee") implies studious people (Thayer).¹ His mother died when he was five, and he was raised and educated by his uncle, an able physician of Nantes. From his father, a brilliant, vain, futile feather-witted man, Laennec acquired the remarkable versatility evinced in his talent for writing verses, flute-playing, dancing and athletics. He began to study medicine at Nantes in 1795. The year 1799 found him an army surgeon, first serving in the military hospital at Nantes, later participating in the Morbihan campaign. He resumed his studies in 1801, graduating from the Paris Faculty in 1804, with a dissertation on the Hippocratic writings. From his teachers, Corvisart (the translator of Auenbrugger), Bayle and Dupuytren, Laennec probably acquired his trend toward physical examination of the chest and pathological anatomy. As a student, he had already described for the first time, the pathological appearances of peritonitis (1802), the subdeltoid bursa (1803), the capsule of connective tissue investing the liver (1803)

¹ Thayer points out that the name is pronounced, and even spelled by Laennec's collateral descendants "Lennee" and not "Laënnec." The customary diaeresis was somewhat officiously added by one of his biographers, Theophile Ambroise. See, Bull. Johns Hopkins Hosp., Balt., 1920, XXXI, 425-435.

and several new species of worms of the genus *Cysticercus* (1804). The memoir on *peritonitis* contains also the first notation of peritoneal tuberculosis. "For general peritonitis," as Thayer observes, "Laennec did that which, some 80 odd years later, Fitz did for appendicitis." His graduating dissertations, in Latin and French, are, however, slight, academic performances. The importance of the Hippocratic method is stressed, but Laennec doubts whether Hippocrates ever lived, suggesting the familiar couplet of Voltaire:

"Pardonnez-moi, dit-il, en lui parlant tout bas,
Mais je crois, entre nous, que vous n'existez pas."

In 1806, Laennec published the first accurate account of melanosis, although his inferences about its ultimate nature were faulty. In 1812, he described an extraperitoneal variety of hernia. Like most of the clinicians of his time, like Bright and the other pathologists before Virchow, Laennec was obviously the acute observer and delineator of what he actually saw, with no particular talent for generalization or effective (heuristic) reasoning. In spite of his physical fragility, his career during the Napoleonic period was one of incessant labor and feverish activity. During 1812-14, he served as assistant physician to the Hôpital Beaujon, during 1814-16 at the Salpêtrière, then a military hospital, where his proficiency in speaking the Celtic dialect was of inestimable aid to helpless Breton conscripts. In 1816, he was made chief of the medical service at the Hôpital Necker. Here, in the same year, he discovered his method of mediate auscultation and invented the stethoscope. In examining a fat woman afflicted with heart disease, Laennec found palpation and percussion impracticable, on account of the "age and sex of the patient," but he suddenly recalled seeing boys listening to the sound of a pin-scratch transmitted to the ear through a stick of wood. He thereupon rolled up a note book and got the heart sounds much more clearly and distinctly than by applying the ear to the precordial region. The first specimens of his invention consisted of three quires of paper, tightly rolled and glued together. He found that a solid cylinder is the best instrument for detecting heart sounds, and that a hollow cylinder intensifies the sound of the voice and of thoracic râles. He therefore devised the wooden stethoscope, which like the first clinical thermometers,

was about a foot long, and which he manufactured exclusively, at a turning lathe in his own room, for the benefit of students of his book. While Hippocrates, Bayle and others had occasionally listened at the chest, the application of auscultation by Laennec to diseases of the lungs and heart was virtually a discovery and of far greater moment than his invention, which he himself named the stethoscope. That this great discovery was the real beginning of physical or instrumental diagnosis is evident from the pages of Laennec's treatise on auscultation, the most important text-book on practice of medicine after Sydenham.²

The first edition of this book (1819) analyses the different signs and symptoms of diseases of the lungs and heart, with reference to diagnosis. As its title implies, it is really a treatise on auscultation. In the second edition (1823), there is a long preliminary section on examination of the chest, followed by a series of chapters on diseases of the bronchi, the lungs, the pleura, the heart and the cardiac blood-vessels, with treatment, as in a modern book on practice. This edition is, in effect, a synthetic treatise on diseases of the chest. Here we find absolutely new and withal masterly chapters on diagnosis and pathological appearances of bronchitis and pneumonia, with what are virtually the first accounts of pulmonary emphysema and oedema, pneumothorax, gangrene of the lungs, pulmonary apoplexy, haemorrhagic pleurisy, with such new diagnostic data as aegophony in pleurisy, pectoriloquy in phthisis, decrease of râles with percussion dulcipleurisy and recognition of tubercles in the lungs as the pathological lesion in phthisis. The section on diseases of the heart in either edition of the book is not so good. In Laennec's time, little was known of the heart sounds, and he himself proceeded upon the erroneous notion that the second sound is due to auricular contraction. This phase of diagnosis had to wait upon the advent of Bouillaud, Corrigan, Skoda and the later clinicians. Meanwhile, Laennec's talent for observation was further demon-

² Laennec's treatise on auscultation passed through four Parisian editions, viz., 1819, 1826, 1831, 1837, two Parisian reprints of 1879 and 1893, a Brussels reprint of 1828, English (London) translations of 1821, 1827, 1829, 1834, 1846, a Philadelphia reprint of the Forbes (London) translation (1823), New York reprints of 1831, 1835 and 1838 and a German version of the first edition (Weimar, 1822).

strated in such original clinical delineations as those of oesophagitis, chronic interstitial hepatitis and the "anatomic tubercle" (lupus verrucosus). At the same time, he contributed many articles on pathological anatomy to the A-F volumes of the *Dictionnaire des sciences médicales*. His method of case-taking at the Necker, and his way of correlating these clinical records with his post-mortem protocols, were of the approved modern type. Eventually these ardors of incessant work began to tell upon his health. He was of slight and fragile frame, and, in spite of his passionate addiction to hunting and athletics, already predestined to die, like Bichat, of phthisis. The infection was probably acquired from an accidental wound of the finger during an autopsy, developing the anatomical tubercle mentioned above. In 1820, worn out with hard work and asthma (incipient phthisis), he found himself obliged to retire to his estate at Kerlourarnec. Here the sea-air eventually restored him to apparent health. After spending two years in this retreat, he could not resist the call to Paris. Laennec returned to the capital in 1822, and shortly thereafter became physician to the Duchesse de Berri and professor of medicine in the Collège de France. He soon acquired a large practice, engaged in a half-humorous warfare with Broussais, whom he slyly likened to Paracelsus, and, in 1824, married his housekeeper. The revision of his book occupied the next two years, but the stress and strain of this work again broke down his health and upon its completion, he again retired to Kerlourarnec in June 1826, to die there on August 15, at the age of 45. A statue by Duquesne was erected to his memory at Quimper in 1868. There is also a bust by Toulmouche and an excellent portrait by Dubois at Nantes, painted in 1812, when Laennec was about thirty years old.³ It represents a man of delicate features, oval face, of whimsical expression, with curly hair and the long upper lip of the Celt. The handsome lithograph executed by Formentin, apparently from a photograph, is the most satisfactory likeness.

³ Copies of these pictures, with cuts showing the manor at Kerlourarnec, the statue at Quimper, etc., may be seen in the volume of selections from Laennec by Sir William Hale-White, in "Medical Classics Series," London, John Bale, 1923.

Dr. Goodrich (Peter Parley) describes a visit to Laennec's clinic at the Charité as follows:

"He is a little man, 5 ft. 3 in. high and thin as a shadow. However, he has acute features and a manner which bespeaks energy and consciousness of power. The whole hospital was neat and clean; bedsteads of iron; French medical practice very light; few medicines given; nursing is a great part of the treatment. Laennec's pupils followed him from patient to patient. He conversed with them in Latin."

Sainte Beuve, a contemporary and himself a student of medicine, already refers to Laennec in *Portraits contemporaines*, as a "great physician," and gives a very pleasing picture of his familiarity, as a flute-player, with the Celtic airs of Brittany.

Our present feeling about Laennec is expressed in the Hippocratic sentence cited by Thayer, which forms the motto of the treatise on auscultation.

"The power to explore is to my mind a great part of the art."

Laennec stands for the kind of physical diagnosis which will never be displaced in medical practice, the kind the Victorian physicians followed, and which can only be really understood and appreciated by collateral studies in the dissecting room or dead house. The many and sometimes elaborate instruments of precision and diagnostic tests now in use have gone far to destroy this power to diagnose without instruments in both student and practitioner of to-day. Thayer instances cases of X-ray appearances mistaken for phthisis, of ulcerative endocarditis treated as typhoid fever, of pleural effusion regarded as unresolved pneumonia, "one hundred years after the publication of Laennec's book." Reliance upon the electrocardiograph is all too common. The fault, as Thayer insists, lies not with the student but in the way in which he has been taught. "Proficiency in the basic methods of exploration, which we owe to Auenbrugger and to Laennec, is as vital to-day as it was one hundred years ago."

F. H. GARRISON

THE NEW YORK ACADEMY OF MEDICINE—ITS OBJECTS, FUTURE DEVELOPMENT AND FINANCIAL NEEDS

FOREWORD

Early in May, the President called together a group of Fellows of the Academy at an informal dinner at which were discussed the needs of the Academy and in particular the library. After a presentation of the facts which are given in the following article it was suggested to the President that a special meeting of the Council be called to discuss in general the needs of the Academy. At this special meeting of the Council held on May 7, the President was authorized to appoint a special committee on increased endowment.

It was agreed that there should be no drive, but that when opportunity offered the members of this special committee should present the needs of the Academy to such individuals as they might deem proper with the hope of securing donations.

The following suggestions were made to the Committee: that the Committee endeavor to interest the Fellows of the Academy in making a personal bequest to the Academy and also to suggest to others the possibility of mentioning the Academy in their wills and that this might also be suggested to lawyers who were frequently called upon to name institutions to which a legacy might properly be given.

The Committee was also asked to consider the possibility of Fellows of the Academy insuring their lives for restricted sums in favor of the Academy.

At the meetings of nearly all the Sections during the winter, the attention of the Fellows has been called to the fact that the dues of the Fellows would have to be increased in order to meet the increased expenses in the new building. If the proposed new activities are to be satisfactorily carried out and the library properly maintained and developed, a million dollars new endowment will only be sufficient to meet the initial needs.

The Council hopes that the Fellows of the Academy will bear these conditions in mind and lend their support to the Academy's activities and aid in such manner as may seem to them advisable and proper.

The New York Academy of Medicine is a membership corporation founded in 1843 and incorporated by the Legislature in 1847. It consists of 1625 physicians who are resident Fellows, 92 non-resident Fellows and 20 scientists who are Associate Fellows, a total membership of 1737.

Object

The Academy is organized for the promotion of the science and art of medicine, the maintenance of a public medical library, the promotion of the public health, and of medical education.

These activities are under the direction of a Council consisting of the elected officers, the chairman of the standing committees and ten elected Trustees.

The Promotion of the Science and Art of Medicine

The Fellows are grouped into thirteen different sections, each one of which represents some special branch of medicine or surgery. These sections hold monthly scientific meetings and there are one hundred and four held annually. In addition, there are sixteen meetings of the Academy. All of these meetings are professional in character at which papers are read on medical subjects, patients are presented and discussed, instruments are shown, specimens removed at operation and autopsy are exhibited and physicians who are not Fellows, from the city and elsewhere, are invited to lecture on new discoveries in medicine. Physicians and dentists who are not Fellows, and medical students frequently attend these meetings and are always welcome.

In addition to the regular meetings of the members of the Academy, 38 medical societies hold their regular meetings in the building. These meetings are also educational in character and are attended by the members of these societies.

The Library

The library of the Academy is the second largest medical library in the United States. It contains 140,000 bound volumes, 104,500 pamphlets, 1,970 medical classics and rare medical books and 43 incunabula or books printed prior to 1500. It also possesses a considerable number of portraits and engravings of medical men, hospitals and medical activities. The card catalogue is readily accessible and is simply arranged for the convenience of

the readers. In the main reading room are found the index catalogues and reference books and bound volumes of journals of the past eight or ten years.

The library staff aid the Fellows and the public in answering inquiries, assisting them in securing needed information and furnishing books to the readers in a very short space of time.

The library is used by 30,000 readers a year, among whom are not only physicians but also public health officials, medical students, representatives of publishing houses and also newspaper men and dramatic writers seeking technical information. (For further information see reprint from the June 1926 Bulletin entitled "Needs of the Library," by Archibald Malloch, M.D., Librarian.)

The Promotion of the Public Health

The Public Health Committee was organized in 1911. It studies various phases of community health, quarantine, communicable diseases, hospitals, dispensaries, day nurseries, convalescent homes, and various other community health activities. The committee advises various city departments and private agencies and makes studies for them which frequently result in improvements of method or operation. The efforts of the members of the committee were largely instrumental in bringing about the transfer of quarantine from New York State to the Federal Government and its advice has been accepted resulting in the abolition of dispensaries, the consolidation of hospitals, and the development of a proper program for the care of different types of disease.

The Promotion of Medical Education

The Committee on Medical Education was organized in 1924. It has made a survey of courses and other opportunities for graduate medical study in New York with a view to improving the value of existing opportunities and encouraging the development of additional ones. A series of synopses describing approved courses and internships has been published by subjects and has been widely distributed. The committee maintains a bureau of clinical information which provides a central meeting place or headquarters where visiting medical men may obtain information regarding all medical activities in the city. It has

collected and classified detailed information regarding opportunities for graduate medical study in other cities of the United States, Canada and Europe and is prepared to advise physicians who desire information regarding such opportunities offered in any medical center. The bureau publishes a daily bulletin of surgical operations and a weekly bulletin of medical clinics given in the important hospitals of the city.

ADMISSION TO FELLOWSHIP

A physician is admitted as a Fellow on account of his professional attainments. He must show evidence of a skill in practice or if not a practitioner, he must hold some responsible position in a hospital, laboratory, or medical school. Further, he must have lived up to the ethical standards of the profession. The Academy is in no sense a club and there are no social activities. The only possible semblance of a social activity is the furnishing of light suppers after stated meetings of the Academy which are provided by the income of an endowment bequeathed for this special purpose by Dr. Alfred L. Loomis.

NEW PROGRAM AND BUILDING

The present quarters of the Academy became entirely too small for its activities as far back as 1910 when a proposal to enlarge the present building at 43rd Street or to secure a new building was first broached. After repeated discussion and postponement due to war, increased prices, and other reasons, a definite plan was agreed upon in 1922 which culminated in a gift of \$1,550,000, from the Carnegie Corporation for a new building and a pledge of \$1,250,000 for the endowment of new educational activities from the Rockefeller Foundation.

The Rockefeller Endowment

The Rockefeller Endowment will provide approximately \$62,500 a year and its use is limited for the salaries of a director, a librarian, and educational activities and is to be employed for the purpose of making studies and surveys of community health problems, for the promotion of post graduate medical education, for the maintenance of a bureau of clinical information and the enlargement of library activities. Those restrictions apply until 1933 but there are none thereafter. This fund cannot be used

for the maintenance of the building nor for the purchase or binding of books, journals and pamphlets, but is strictly limited to new educational activities, most of which have already been undertaken.

New Building

The new building situated at the south east corner of 103rd Street and Fifth Avenue on a lot 100 x 175 feet is rapidly approaching completion. The building will contain a large auditorium and five large meeting rooms. There are commodious reading rooms for the library and a stack which will hold 250,000 volumes and which is capable of being enlarged. It also will provide for the Academy's administrative offices and committees and also the offices of the Medical Society of the State of New York, the Medical Society of the County of New York, the First District Dental Society, the Society for the Relief of Widows and Orphans and the New York Physicians Mutual Aid Association and nearly all of the thirty-eight special medical societies and others will hold their meetings in it.

NEW ACTIVITIES

Committee on Medical Education

The continued promotion of postgraduate medical education will demand an additional staff to make the necessary studies under contemplation. Studies should be made of sickness and its causes, the results obtained in various hospitals, the different methods employed in these hospitals and a comparison of the results, the creation of new teaching courses in special hospitals not now utilized for this purpose, cooperation with various medical schools in the development of postgraduate teaching and other opportunities which are being considered for improving the possibilities of medical practice.

Lectures

Under the auspices of the Committee on Medical Education it is proposed to give a series of lectures annually on clinical subjects for the members of the medical profession and also to provide popular lectures for the community on medical subjects. It

is also proposed to keep the public informed on questions relating to disease and its cure.

The Committee on Public Health Relations

This committee will continue its studies and will, it is hoped, take a more active part in cooperating with the various city departments that have to do with the prevention of sickness, care of patients, the safe-guarding of the city's food and water supplies and the disposal of the city's wastes. To carry out these plans, the Public Health Relations Committee will need additional funds.

Library

The Academy has agreed that the library should be further developed. The new building will permit the reading rooms to be open to the public until five in the afternoon. Additional periodicals in Spanish and Italian should be obtained as well as chemical journals. A book delivery service should be developed. Bibliographers should be employed to aid in the preparation of scientific articles. A photostat should be installed for making photostats of rare pamphlets, books or illustrations. Exhibitions of medical works, medals, instruments, etc., should be given from time to time. Brooklyn has its own medical library but serious consideration should be given to providing reading rooms for physicians in the Boroughs of Bronx and Queens. The collection of incunabula and medical classics should be enlarged.

A medical library differs from a general library only in that its work is limited to a special field. The library will need an increased endowment for the purchase of books, pamphlets, periodicals, classical books, incunabula, portraits, engravings of medical celebrities, etc. The Academy has received twenty special bequests for the library. Nineteen of these are restricted to the purchase of books. The income of one only may be used for the maintenance of the library. These sums, however, are small and the total income amounts to \$15,000.

FINANCES OF THE ACADEMY

The Academy owns the new site and will own the new building free and clear of mortgage. The present annual expenses of the Academy are \$171,000. Its present income is as follows:

From permanent endowment	\$15,000
From Rockefeller Foundation	53,000
From assessment for the use of rooms	12,000
From dues of Fellows	33,000
From Witthaus estate	6,000
From miscellaneous income	13,750
Total	\$162,750

For 1926 only, there is an available balance of \$8,250 for special purposes.

The annual expenses of the Academy in the new building will be \$225,000. The income of the Academy will be increased by the proceeds of the sale of the present premises after the payment of a mortgage and the equipment of the new building, by \$22,250, which will bring the total income up to \$185,000. The proper maintenance of the Academy and its activities requires an increased income of at least \$10,000 annually.

SPECIFIC NEEDS

The Academy needs an additional endowment

For the Committee on Medical Education of	\$100,000
For the Committee on Public Health Relations of	250,000
For the adequate maintenance of the library of	600,000
For lectureships of	50,000
	\$1,000,000

INCREASED ENDOWMENT NEEDED

Many of the Fellows will recall that the two underlying reasons for abandoning the 60th Street site were the high cost of the land and the very large increased cost of maintenance when the new building would be finished. The sale of the 60th Street property and the final decision to build at 103rd Street has increased the Academy's endowment by about \$700,000.

In Bulletin Volume II, No. 2, published in February, 1926, there was a statement signed by the Treasurer showing the status of the Academy's finances and the need for increased funds.

At a meeting of the Council held in May the President was authorized to appoint an Endowment Committee for the purpose of securing additional funds for the Academy. The following Committee was therefore appointed: Dr. Brown, Chairman, Drs.

Stewart, James, Pool, Lyle, Patterson, Sachs, Bullock, Sondern, Haynes, Libman, Malloch, McKernon, Foster, Lusk, van Beuren, Kast, Starr, Morris, Stillman, Dana, Miller, St. John, Wallace, Milliken, Beekman, Elsberg, Carter, Delavan, Duel, Moorhead, Cecil, Senior, Blodgett, Hunt, Hartwell and Williams.

At meetings held by this Committee it was agreed that there should be no drive but that every effort should be made by the Committee to secure funds for endowment and it was also agreed that the Committee should endeavor to persuade as many of the Fellows as possible to mention the Academy in their wills in such amount as they feel it possible to bequeath to the Academy.

The Endowment Committee agreed that an additional million dollars should be secured and agreed with the Council that it would be necessary to increase the dues in 1927. The Committee is happy to report that it has received a pledge of \$10,000 a year for five years beginning January first and an unconditional gift of \$36,000.

A statement was prepared by the Librarian, Dr. Archibald Malloch, outlining the special needs of the Library. Reprints of this article have been made and copies will be sent to any of the Fellows upon request.

The Council has realized for over a year that the dues of the Fellows would have to be increased and during the winter they instructed the Director to speak before as many of the Sections as possible on the necessity of increasing the dues next year. In the year 1927, the Academy will need an additional income of \$55,000 and this sum must be raised either by increased endowment or dues. The increase of the dues has been discussed on a number of occasions and it has been agreed by the Council to postpone any definite recommendation until November, as the amount of the increase will depend upon the success of the Endowment Committee. The Council desires to bring to the particular attention of the Fellows the fact that dues have not been increased since 1890, when they were raised from \$10 to \$20, and that at the present time the income from dues is approximately \$32,000 and that in the present building these dues just pay for the heating, lighting and maintenance of the building, and that no part of the dues is used for the Library, the Committee on Public Health Relations, the Committee on Medical Education

or for salaries of the administrative personnel. It is estimated that the new building will cost at least \$65,000 a year for maintenance and it is hoped that the Fellows will appreciate the necessity of meeting most of the expense of maintenance from dues.

CARBON MONOXID POISONING AND THE AUTO-MOBILE EXHAUST

Review of Literature

by

The Special Sub-Committee of the Committee on Public Health Relations

INTRODUCTION

Carbon monoxid poisoning is closely related to the history of mankind. This dangerous gas was produced when fires were first kindled and is encountered whenever organic matter is burned. The effects of carbon monoxid were known in antiquity. Lewin in his exhaustive monograph on the history of carbon monoxid poisoning gives numerous quotations from the ancient writers. Aristotle, nearly 300 years B. C., observed that "men suffer from heaviness of the head and often die from coal gas."

The many cases of carbon monoxid poisoning described in the literature of antiquity clearly indicate that this poison has been, since early time, a frequent cause of death by accident or by suicide and has even served as an instrument of punishment and torture.

Julian the Apostate (331-363 A. D.) tells how during a severe winter in Lutetia, now Paris, he had a small fire brought into his room which "affected his head and put him to sleep; he being carried out unconscious."

Plutarch claims that Catulus, after Marius decreed he should die, shut himself in a room and "suffocated himself with the vapor from many glowing coals." In 68 A. D. Seneca after a number of attempts at suicide finally "ended his life by breathing the vapor of burning charcoal."

Carbon monoxid as a means of punishment is frequently recorded in ancient literature. Hannibal (247-183 B. C.) put the

inhabitants of Nuceria to death by "coal vapor." Many of the martyrs met death from carbon monoxid fumes in smoke.

Carbon monoxid is undoubtedly one of the most widespread and important poisons associated with human life and industry. Whenever any organic substance is oxidized, carbon monoxid is one of the products of the combustion. It has been shown by many writers that there is scarcely a single industrial activity in which carbon monoxid is not encountered.

At the First International Congress of Labor, held in Washington in the fall of 1919, the delegates were instructed to call the attention of their respective governments to the steady increase in industrial carbon monoxid poisoning and to request that investigations be made with a view to its prevention. The very marked increase in recent years in the number of such cases has been largely due, it is believed, to the extended use of illuminating gas as a source of heat and power and to the rapidly increasing use of the internal combustion engine whose exhaust contains more or less carbon monoxid.

One reason why in the past the public has not been more cognizant of the dangers of carbon monoxid as compared to some other industrial poisons is that the gas is colorless, tasteless, and practically odorless and does not, like chlorine or a number of other gases, produce immediately such irritating effects, when breathed in low concentrations. If the amount of carbon monoxid present in the air being breathed is small, the victim commonly has no warning that he is being exposed to a dangerous poison until the gas has so far affected him that he is powerless to aid himself.

A question of very considerable importance in any study of carbon monoxid poisoning is that of the rapidity with which the gas is given off after it has once combined with the hemoglobin of the blood. Glaister (*Gas Poisoning*, p. 324) states it is a combination most difficult to disturb. Apfelbach (*Kober & Hanson, Diseases of Occupation*, p. 46-47) calls attention to the fact that the affinity of the hemoglobin for carbon monoxid is 300 times greater than its affinity for oxygen and that CO unites rapidly with the hemoglobin, replacing the oxygen and forming a very stable compound, which is probably never dissociated until the blood corpuscle meets its death and is eliminated.

On the other hand, Hamilton maintains that in spite of the avidity with which CO is taken up by hemoglobin, the resulting combination is unstable and the red cells readily surrender the CO when pure air is breathed. Nicloux (*Compt. rend. de la Soc. de Biol.* 1901, 53, 120) finds that blood corpuscles are not devitalized even though they have been fully saturated with carbon monoxid and will perform their normal function when supplied with oxygen. Michel (*Ueber die Dauer der Nachweisbarkeit von Kohlenoxyd im Blute und in Blutextravasaten uberlebender Individuen. Vierteljahrsschr. f. Gerichtl. Med.*, 1897. Vol. 14, p. 36) says that though the combination of CO with hemoglobin is more stable than the oxygen combination, the former is disestablished or disunited not merely by the mechanical but also by the vital processes of the circulation. He believes that in general the CO is thrown off in a quarter of an hour in pure air. He is also of the opinion that the period of time during which the presence of carbon monoxid may be detected in the blood does not depend alone upon the duration of the period of exposure or its intensity, but upon individual peculiarities as well. In most cases, however, the length of time during which CO may be detected depends largely upon the period of exposure.

The combining power of carbon monoxid and hemoglobin is about 300 times that of oxygen and hemoglobin. It might be expected that carbon monoxid would show its greatest avidity for oxygen-free hemoglobin, but Hill and Barcroft (*Bio-Chem. Jour.* 1913, V. 7, 471, *ibid.* 481) have shown that carbon monoxid enters into combination more readily when a little oxygen is present than when it is completely absent; in other words more CO will be taken up by unsaturated oxyhemoglobin than by oxygen-free hemoglobin.

Hayhurst (*Problems of Carbon Monoxide and Automobile Exhaust Gases*) has pointed out that although the blood in the general circulation may contain a very high percentage of carbon monoxid there may be practically none in the spleen, but that when the CO eventually reaches the spleen it is retained much longer than in the general circulation. Barcroft (quoted by Hayhurst) states that from animal experimentation it has been found that unless the CO reaches more than 20 per cent. saturation in the resting animal the gas does not penetrate the spleen

pulp, which will remain entirely free from the gas for as long as four hours. In active animals the CO hemoglobin penetrates at once into the spleen pulp so as to be noticeable within five minutes.

While it is known that this gas is responsible for many thousands of deaths in the United States each year, it is not known how many cases of so-called "severe" carbon monoxid gassing occur without immediate fatal termination. A considerable portion of the writings on carbon monoxid poisoning are by industrial hygienists who devote their attention largely to the cases that have been more or less severely gassed and are in need of medical attention. As a result, the literature on the subject contains relatively few studies on the loss in industrial efficiency to those who are frequently exposed to low and well diffused concentrations of carbon monoxid; and even less attention has been given to the possible menace of carbon monoxid to every man who lives or works in our crowded cities.

Each year a considerable number of deaths of an accidental character is due to the carbon monoxid in the exhaust of automobiles. These deaths occur principally in the winter in private garages as a result of starting and "warming up" an automobile in a closed or confined space. When the engine is run "idled" to warm it in cold days with the garage doors closed, the atmosphere of a space amply large enough to hold a car is contaminated to a very dangerous extent (25 parts of carbon monoxid in 10,000 of air) within five minutes, and within ten minutes the concentration of the gas reaches a point rapidly fatal to life.

At present, practically all internal combustion engines depend for their motive power upon the explosive nature of a mixture of air and a petroleum distillate, generally "gasoline."

There are two distinct groups of opinion concerning the cumulative effects of breathing carbon monoxid in small concentrations. The one of which Haldane is the chief exponent maintains the view that all symptoms of carbon monoxid poisoning, primary and secondary, are attributable solely to lack of oxygen, while the other group ascribes the symptoms to the specific toxic effect of the carbon monoxid itself.

I

ANOXEMIA

Dr. Alice Hamilton, in her recent book "Industrial Poisons in the United States" (Macmillan, 1925, p. 371 et sequa), has very clearly stated the case as viewed by Haldane and others.

The effect produced by carbon monoxid, according to this school, can be traced to the lack of oxygen and the symptoms are those of anoxemia. Haggard (Studies in Carbon Monoxid Asphyxia; I. The Behavior of the Heart, *Am. J. Physiol.*, 1921, 56, 390-403) maintains that there is no direct toxic action of carbon monoxid on the heart; for if respiratory failure is prevented by means of administration of 8 to 10 per cent. carbon dioxid, the CO combination with the hemoglobin may rise to an unusually high percentage without any evidence of impairment of the heart function. Death in cases of carbon monoxid asphyxia is due to the failure of respiration of the nature of a fatal apnea vera. Haggard further states that the lack of oxygen resulting from the formation of CO hemoglobin induces excessive breathing which in turn results in an abnormal loss of carbon dioxid followed by failure of respiration. The increasing anoxemia from this cause speedily results in the development of heart block through its various stages.

During the period of carbon monoxid asphyxia, injury to certain tissues may occur because of the temporary deprivation of oxygen. Those cells whose need of oxygen is greatest suffer the most severe injuries. This, however, is not, strictly speaking, a toxic action since, as Henderson (*J. A. M. A.* 1916, 67, 580) says, "It is not retention of carbon monoxid nor any direct action of the gas, but the result of the injury to the brain and other organs due to insufficient oxygen supplied by the blood while the patient was breathing the gas, which is responsible for the prolonged coma and subsequent death or incomplete recovery."

Haldane, in support of his view that all the symptoms of carbon monoxid poisoning are referable simply to want of oxygen, cites the fact that if animals are placed in oxygen under a pressure of from one to two atmospheres and carbon monoxid forced in on top of the oxygen, these animals continue to live notwithstanding the fact that the blood and tissues are saturated with

the CO gas. "But it has been pointed out (Glaister and Logan, *Gas Poisoning*, p. 351) that such animals receive from the high pressure oxygen enough of the gas in simple solution in the arterial blood to supply the tissues, in spite of the presence of the carbon monoxid."

The cause of the lesions in the central nervous system frequently found after death from carbon monoxid poisoning has been the source of much divided opinion. According to Dr. Hamilton (*Industrial Poisoning in the United States*, p. 374), the earlier investigators attributed them to a primary toxic action of the CO on the central nervous system, while others, especially the more modern pathologists, maintain that the changes are due to oxygen deprivation.

Balthazard (*Les Idées actuelles sur l'Intoxication oxy-carbonée*, Bull. de l'Acad. de Med. 1919, 41, 439) opposes the view that carbon monoxid has a direct toxic action on the nervous system, holding that the degenerative changes reported are anti-facts and that all the manifestations following CO gassing may be explained as the result of oxygen starvation. It is felt by many that this view is supported by the work of Haggard (*Studies in Carbon Monoxid Asphyxia; II. The Growth of Neuroblast in the Presence of Carbon Monoxid*. Amer. Jour. Physiol., 1922, V. 60, p. 244-249), who showed, by growing neuroblasts in vitro, that carbon monoxid itself even in a concentration of nearly 80 per cent. exerted no injurious effects upon the growing nerve cells. In this respect, it is as inert as nitrogen. Illuminating gas on the other hand was found to be poisonous to neuroblast culture even when present in concentration as low as 0.1 per cent.

II

SPECIFIC TOXICITY

The members of the other school of opinion believe that the deadly effects of carbon monoxid are largely due to a specific toxicity of the gas. Linossier (*Contribution à l'Etude de l'Intoxication Oxy-carbonée*. Lyon Méd., 1889, No. 28, p. 357) has shown that snails whose blood does not contain hemoglobin, when placed in an atmosphere of carbon monoxid and oxygen die more quickly than is the case when they are placed in an atmosphere

of hydrogen or nitrogen and the same proportion of oxygen as in the former case. Linossier has also shown that animals die more rapidly when exposed to carbon monoxid than when simple asphyxia is induced by placing them in an atmosphere of physiologically inert nitrogen. Lamie (*Contribution à l'Etude de l'Intoxication Oxycarbonée*. Bordeaux, 1891, 75 p. No. 20) working along similar lines has pointed out that frogs are capable of living three and a half hours in nitrogen, but only for one and a half hours in carbon monoxid.

The opponents of the anoxemia theory of Haldane declare that if this theory explained all the conditions, the use of oxygen gas should in the case of survivors of exposure to carbon monoxid prove more frequently successful in restoration than is generally experienced. Of course, it may be explained that owing to the action of the gas, the brain, heart and lungs have been so crippled by want of oxygen, as not to be able to make use of oxygen when artificially supplied.

Geppert (*Kohlenoxydvergiftung und Erstickung*. Deutsche Med. Woch., 1892, 12th May, p. 418) concludes as a result of experimental research that carbon monoxid exerts a specific action on the nervous system since the type of respiration which follows the inhalation of CO gas differs materially from that observed in oxygen-starvation with slow asphyxiation. Glaister (*Glaister & Logan Gas Poisoning*, p. 353-4) believes that as the respiratory centers do not respond to the lack of oxygen by an increase in respiration, it is a legitimate inference that CO has a particular specific action on the nerve centers and nerve tissues.

Apfelbach (*Kober & Hanson, Diseases of Occupation*, p. 47) has pointed out that the sequelae, particularly those of the nervous system, which frequently follow CO poisoning even with small doses, are accompanied by definite pathologic changes which indicate the toxicity of carbon monoxid. Moreover, the gas is rapidly narcotizing, and the earliest symptoms, such as weakness in the lower limbs, are strongly suggestive of some distinct toxic action.

Hayhurst in discussing the question of whether asphyxia explains all the phenomena of CO poisoning has pertinently asked, "How do we explain the fact that in acute cases of poisoning such as occur after a few minutes of exposure in a closed garage,

nervous symptoms such as weakness of the knees, faintness and loss of consciousness *invariably* occur before warning respiratory symptoms such as shortness of breath, rapid breathing, cyanosis and such phenomena usually associated with asphyxia or air hunger?"

The discovery by Claude Bernard that in carbon monoxid poisoning the oxygen was expelled from the blood by the former gas led to the theory that CO acts by producing asphyxiation but the question as to whether the CO itself had any specific action was not raised at that time. It was known that in CO poisoning there was no dyspnoea as in ordinary anoxemic asphyxiation. In the latter case the system endeavors to obtain more oxygen by rapid and forced respiration and increased pulmonary action.

"It would appear that a reasonable explanation of the action of the gas upon the body organism is that negatively the organism suffers from the relative anoxaemia which is consequent upon the excess presence of CO in the air, but it also suffers positively from the action of this upon the blood and through the blood upon the central nervous system." (Glaister and Logan, Gas Poisoning, p. 352.)

Regardless of what may be the belief as to the nature of CO poisoning, whether CO causes only a simple asphyxia or is a toxic agent, it is well recognized that where carbon monoxid has been inhaled for a considerable time the damage done to the nervous tissue, especially the vital nerve centers, is very serious. Some observers declare that carbon monoxid exercises a specific action upon the central nervous system through the circulating blood. Carbon monoxid apparently exerts a specific action upon the nervous mechanism of the heart which has been attributed to its specificity for the nerve centers.

III

CLINICAL SYMPTOMS

Carbon monoxid poisoning is commonly referred to as being either of an acute or chronic character.

A. *Acute*

The onset of symptoms in acute poisoning may be as sudden as a stroke of lightning, and this is frequently the case among workers at blast furnaces and in coal mines.

The suddenness of death in mine accidents is clearly shown by finding the dead men with their lunches in their hands, or still holding their miners' picks as in the act of using them again. Usually however, even in exposure to a high percentage of the gas, the man has some warning that an attack of the gas is threatening. In contrast to cases with sudden fatal onset, gassing may occur in so mild a manner as to produce only a headache.

In some cases a relatively high percentage of carbon monoxid may cause premonitory symptoms such as pressure and throbbing in the head, a feeling of the legs giving way under one, blurring of the sight, or roaring in the ears. In some cases, a sweetish taste or feeling of dryness and constriction in the throat, or nausea or a pain in the stomach has been noted. Glaister reports that many coal miners have told him of a feeling of weakness in the legs that warned them of the presence of the dangerous monoxid, but that the gas had already so dulled their minds that they kept on working in a mechanical way until they fainted.

Sir D. LeNevell Foster in his now classic description of his experience when overcome by carbon monoxid while performing rescue service at the time of the great Snaefell mine disaster, stated: "I suddenly felt decidedly queer; I took out my little brandy flask, but already my fingers seemed incapable of opening it. Everything seemed to be in a whirl, there seemed to be dense white fog. We all sat still without trying to escape. The foot of the ladder was quite near but none of us made an effort to reach it."

When he found himself being overcome he took out his note book to write a farewell letter to his wife and children. In this letter (Glaister & Logan, Gas Poisoning, p. 126) he repeats many words again and again and sometimes whole sentences. Later he remarks, "I had absorbed enough of the poison to paralyze me to a certain extent, but at the same time my reason had not left me. The general sensation was like a bad dream, and yet I was able to reason and write intelligently, though in a disjointed fashion." When he was rescued and brought to the surface he had a feeling of exhilaration and was in full possession of his senses. A few hours later he felt very sick and afterwards became unconscious and had an epileptiform seizure.

According to Haldane, when the amount of carbon monoxid is not more than ten parts in ten thousand the blood of a man breathing it may progressively take up carbon monoxid till fully 50 per cent. of the hemoglobin has become saturated with it. At that point the man suffers from its effects so that he becomes confused, his intellect is dulled, and there is muscular weakness. If he remains at rest, he may escape serious consequences even at this concentration, but if he makes any considerable exertion to escape from such an atmosphere, he may lose consciousness. Such a person would be said to have experienced a case of acute carbon monoxid poisoning.

One of the physicians of the United States Steel Company, who in his seventeen years of experience has seen hundreds of cases of CO gassing, states that he has observed that in cases of sudden gassing at the steel mills, if the man is not killed outright he always recovers and needs no treatment other than to be removed from the gas filled atmosphere. The severe cases are brought to the hospital usually within twenty minutes after the accident unconscious, with stertorous respiration, rapid and deep, face not cyanosed or only slightly so, with pulse 80 to 120 but neither weak nor bounding. In some cases the man passes from unconsciousness into violent maniacal delirium, in which he struggles and seems to have hallucinations. This stage lasts from fifteen minutes to an hour. It is accompanied by vomiting and lack of control of the bowel movements. Normally sleep follows, although at times it must be induced. After two to eight hours, the man awakens with a severe headache which persists several hours but with no other symptoms. Then for about a day he complains of weakness and general lassitude, but after that he returns to work. Even the worst cases of sudden CO gassing are out only 72 hours.

B. After Effects

Glaister maintains that the course of the poisoning determines the after effects. Slow, gradual gassing produces much more severe and permanent damage than does a rapid poisoning even though the latter may result in coma, convulsions and delirium.

Practically every man who recovers from a severe gassing suffers a headache so severe that it seems as though his head

would split. He is dizzy, and his muscles are so weak that he may not be able to walk or even keep his head erect. Very commonly, there are far more serious aftermaths of CO gassing. The nature of such sequelae do not, however, depend for their character upon exposure to a definite concentration of the gas for a known length of time. The individual's idiosyncrasy to carbon monoxid is probably an important factor in determining the form which these sequelae of a more permanent nature will take. One man may be left paralyzed, another may lose his memory, a third his eyesight and a fourth his power of speech, and so on; yet each may have been subjected to practically identical conditions.

Poelchen (*Gehirnerweichung nach Vergiftung mit Kohlendust*. Berl. Klin. Wochenschr., 1882, V. 19, p. 396) remarks that in East Prussia it is generally believed that those who have survived CO gassing sooner or later show signs of mental deterioration. According to Lewin, these cases offer the greatest difficulty when it comes to deciding upon compensation. Poelchen describes the case of a woman who lay unconscious for two days as a result of carbon monoxid poisoning, but who apparently fully recovered and was able to attend to her household duties for more than two weeks. She then suffered a relapse, her limbs become more or less rigid, her power of speech was almost completely lost, and there was a marked mental apathy. Less than four weeks after the accident, she died of paralysis of the bowels. Lewin mentions a case of severe gassing which had apparently recovered in 36 hours except for headache, but twenty days after the accident the man had a relapse with increasing paralysis of the limbs which became complete on the twenty-fourth day and resulted in death the day following. Another victim was up and about for five or six days after the accident when he was seized with convulsions followed by paralysis of the jaw and death.

C. *Variations in Susceptibility*

There is a great difference in individual susceptibility to carbon monoxid as is shown by many accidents involving a large number of people. It has frequently happened that in mine disasters many of the men will be found dead while others in the same entry will survive. Some authorities feel that women

are less susceptible to carbon monoxid than men and point out that in a number of cases where whole families have been poisoned, the woman has escaped with her life, while the man and the children are found dead.

It has been noted around steel plants and in large automobile repair shops that some men appear to be immune to carbon monoxid. Experience has shown that these men are able to work in an atmosphere in which more susceptible persons would immediately succumb.

It is generally felt that middle aged men are less susceptible to carbon monoxid than are young men and those well along in years. Some foremen, in industries where minor CO gassings are of more or less frequent occurrence will not allow young men to undertake work where they are likely to be exposed to the gas. Where a group of men have been gassed, it is generally found that the young men are most quickly overcome and make the slowest recovery.

It is certain that in most cases the length of exposure, the percentage of carbon monoxid and other conditions such as the amount of carbon dioxid present and the diminished proportion of oxygen have a very important influence on the severity of the poisoning. But many cases are on record where brief exposure to small quantities of CO has caused death so that idiosyncrasy or individual susceptibility seems to play an important role. Again, one person may have been very seriously poisoned and yet make a very rapid and complete recovery showing no after-effects, while another who did not appear to be seriously gassed and who did not lose consciousness may develop very serious sequelae and even die.

D. Tolerance or Immunity

Some medical writers who have given much attention to the problem of carbon monoxid poisoning feel that this apparent immunity may possibly be accounted for by the development of a greater number of red blood corpuscles. As the oxygen carrying power of the hemoglobin is destroyed by combination with the carbon monoxid, new corpuscles are formed thus minimizing the loss of the oxygen carrying power of the blood.

It seems therefore that the question of idiosyncrasy is intimately bound up with that of establishing a tolerance or im-

munity to the gas. In a number of instances where whole families have been gassed, it is known that the mother, who was the only survivor, had for days previous to the fatal accident complained of headache, nausea, weakness of the limbs and other symptoms of carbon monoxid poisoning. The exposure during these days had probably led to a certain amount of tolerance being established. There are a number of cases on record of automobile repair mechanics who suffered from nausea, headache and other symptoms indicative of CO poisoning when they first commenced this work but in a few days' time they recovered from these symptoms and did not again experience them though they continued in the same occupation. On the other hand, there are on record cases of repair mechanics who did not recover and develop an immunity, but whose symptoms steadily became more severe until they were forced to give up this type of work. Health Commissioner Bundesen of Chicago reports that a number of traffic officers at busy corners where there is a heavy automobile traffic experience all the symptoms of carbon monoxid poisoning, until they got out into the fresh air of the open country when they fully recover. Other traffic officers have experienced these symptoms only when first going on duty though they may re-occur on days of extra heavy traffic. H. S. Forbes (*A Survey of Carbon Monoxid Poisoning in American Steel Works, Metal Mines and Coal Mines. J. Ind. Hyg., 1921-22, V. 3, p. 11*) believes that there is good evidence that men frequently exposed to the gas acquire a certain degree of tolerance to CO. He cites the instance of a mine foreman who on many occasions during his fifty years as a miner had suffered daily headaches for months at a time, but who was confident that he could stand the gas better than he could as a boy and that he was much less affected than a "greenhorn" would be.

The duration of the symptoms, as has already been noted, varies widely. It has been observed that in some cases a man may at first suffer severely when undertaking work in an atmosphere more or less contaminated with carbon monoxid, but after a short time these symptoms may disappear and not be experienced again unless the concentration of the gas is considerably greater than that normally encountered. With others the symptoms continue to increase.

E. *Chronic*

All writers appear to be agreed that slow gradual gassing is far more serious to a man than to be suddenly "knocked out" by a high concentration of the gas. Kober and Hayhurst define chronic carbon monoxid poisoning as the result of subjection to repeated continuous small doses of carbon monoxid which do not however produce at any one time a marked symptom complex. Dr. Hamilton (*Industrial Poisons in the United States*, p. 385) however says it is a disputed question whether prolonged exposure to small quantities of carbon monoxid produces chronic poisoning. The answer appears to hinge on an understanding of the term chronic poisoning. Lewin maintains that it can not be regarded as an accumulation of the gas in the body, which when it reaches a certain degree brings on characteristic symptoms. For this to happen, a person would have to remain continuously in air containing carbon monoxid, a condition which does not occur in life, as the CO acquired in contaminated air is always sooner or later thrown off in pure air. Therefore, according to Lewin a chemical accumulation does not take place and carbon monoxid can not act as a cumulative poison as occurs in the case of chronic lead, phosphorous or radium poisoning. However, there may be a cumulated effect of all the injuries indirectly done to the body tissues through the lessening of the oxygen carrying power of the blood. The injury may be simply a disturbance of cell nutrition due to anoxemia and resulting in the formation of toxic products which in turn produce their own effects. Henderson points out that parenchymatous degeneration of the tissues may be initiated by breathing carbon monoxid and that there is no known method of restoring these tissues to normal.

Glaister states that cases of chronic carbon monoxid poisoning may occur in any place where CO is given off in even small amounts and that it must not be forgotten that carbon monoxid poisoning owing to its cumulative action may occur even in the open air.

The symptoms of chronic carbon monoxid poisoning are so varied that it is very difficult of recognition, and its diagnosis is frequently arrived at solely by a process of elimination. It has often been mistaken for many other diseases. It has been erroneously called pernicious anemia. Pottenkofer has listed several

cases of CO poisoning that at first were diagnosed and treated as typhoid fever. Chapman feels that on many occasions cases of carbon monoxid poisoning have been mistaken and treated for lead poisoning. Pütz (*Ueber Vergiftung durch Produkte der unvollständigen Verbrennung speciell durch Kohlenoxyd*. Inaug. Dissert. Halle, 1882, p. 48) describes three cases of poisoning by charcoal vapour where a croupous membrane was formed which caused stenosis of the passage necessitating tracheotomy. Cases of CO poisoning showing an extensive diphtheric exudation have been described (Ziemessen quoted by W. Sachs. *Die Kohlenoxydvergiftung in ihrer klinischen, hygienischen und gerichtsarztlichen Bedeutung*. Braunschweig, F. Vieweg u. Sohn, 1900, 236 p.). Acute laryngitis and bronchitis are very frequent after-maths of exposure to carbon monoxid. Landouzy (*Lancet*, No. 11, 1905) declared before the International Congress on Tuberculosis in Paris in 1903, that such symptoms as headache, giddiness, palpitation, nausea, weakness, etc., which he regarded as due to more or less continuous inhalation of small amounts of CO were ordinarily ascribed by the doctors to over-work, functional or organic disease of the digestive organs, neurosis, improper diet, etc. In such cases, all treatment failed to cure the patient, until he had been removed to the fresh air of the country. Landouzy believed that frequent inhalation of small amounts of CO were undoubtedly one of the predisposing causes of tuberculosis. The part played by carbon monoxid in rendering persons, particularly miners, easily susceptible to tuberculosis is discussed at some length by the Transvaal Phthisis Commission.

A considerable number of physicians who have given attention to the effects of small amounts of carbon monoxid upon man are of the opinion that a truly large variety of ailments of doubtful etiology may be found to be manifestations of chronic carbon monoxid poisoning when all the data are available.

The milder manifestations of chronic CO poisoning are likewise many and varied. An early and very common symptom is frequent and often intolerable headaches which, when exceptionally severe are accompanied by nausea and vomiting. A peculiar feature of headaches of this origin is that they frequently do not occur until the patient leaves his work and goes out into the open air or at least away from the carbon monoxid.

Attacks of giddiness are very common; another frequent symptom is a lack of muscular control that causes a man to stagger as he walks and is associated with marked fatigue. At times the symptoms of chronic carbon monoxid poisoning closely resemble those of alcoholism. Glaister, Lewin and others who have had much experience in medico-legal work feel that, on not a few occasions, justice has miscarried and a man has been pronounced "drunk" when he was actually suffering from CO poisoning.

Frequently the digestive system is deranged; there is a marked loss of appetite and food does not taste as it should. Shumway (Chronic Carbon Monoxide Poisoning, An Increasing Danger to Municipalities from Automobile Traffic) calls attention to cases that at first were thought to be suffering from ulcerations of the stomach, but it was ultimately shown that they were suffering from the effects of chronic carbon monoxid poisoning.

Loss of sleep is not uncommon; other patients lose their sense of taste or smell to a great extent; while still others have had their eyesight so disturbed that they have placed themselves in the hands of oculists who, not recognizing the source of the trouble, have failed to give relief.

Lewin, Glaister and others have called attention to the danger of pregnant women being exposed to carbon monoxid as the gas may pass from the mother's blood into the blood of the foetus. There are quite a few cases on record of a mother having survived CO gassing and later giving birth to a dead child. Lewin believes that there is evidence to show that an amount of carbon monoxid in the mother's blood which is too small to produce symptoms in her alarming enough to attract attention may be sufficient to kill the child in utero and that such poisoning is probably fairly common in industries where women are employed and where the air is contaminated with carbon monoxid. In early Roman days the smoke from extinguished candles was inhaled to bring on premature labor.

F. *Relapses*

Dr. Hamilton (Industrial Poisons in the United States, p. 385) states there is also a relapsing form of carbon monoxid poisoning in which, after apparent recovery and a period of fair

health, serious symptoms which may result in death or insanity suddenly develop. It is very probable that this so-called relapsing form of CO poisoning is but a delayed manifestation of the very great variety of sequelae following slow, gradual chronic carbon monoxid gassing.

A list of the forms in which relapses from CO poisoning may manifest themselves would prove voluminous, but among the more common may be mentioned pneumonia, particularly bronchial pneumonia, blindness, deafness, permanent weakness, paralysis of various forms, delirium, dementia, amnesia, loss of will power, loss of speech, aphasia, nervous disorders, and a breaking down of the various body functions.

These manifestations may appear some time after exposure to carbon monoxid without the patient previously having been thought of as a victim of CO poisoning; yet such disturbances may rightly be classed as sequelae of carbon monoxid gassing.

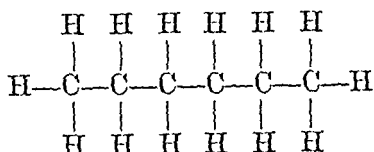
IV

COMPOSITION OF GASOLINE

The character of gasoline varies in different parts of the country, but generally it may be considered as that portion of crude petroleum which distills at temperatures between 140° F. and 158° F., and which has a specific gravity of from 0.636 to 0.70. The product that distills below 140° F. is known as Chymogen, and that above 158° F. as benzine or naphtha.

Gasoline is a combination of the hydrocarbons, pentane, hexane and heptane with some impurities which however seldom reach, in the gasoline readily available at public filling stations, a percentage that would warrant their consideration in this discussion.

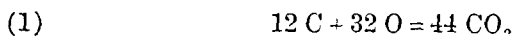
The major constituent of gasoline is hexane, a hydrocarbon of the formula C_6H_{14} with the following molecular construction:



It may be computed that this represents a composition of closely 83.7 per cent. carbon and 16.3 per cent. hydrogen.

For the present purposes gasoline may be considered as composed solely of hexane, as pentane (C_5H_{12}) is 83.3 per cent. carbon and 16.7 per cent. hydrogen, and heptane (C_7H_{16}) varies as little in the other direction in its carbon and hydrogen content.

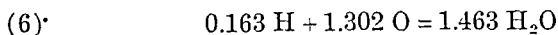
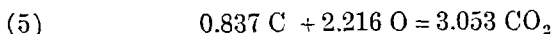
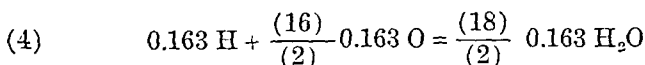
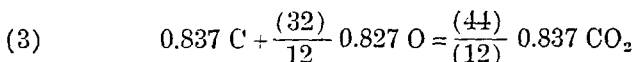
When the explosion occurs in the automobile engine the carbon atoms in the gasoline vapor combine with some of the oxygen of the air to form carbon dioxide (CO_2) while the hydrogen unites with more oxygen to form water (H_2O). Using the atomic weights as coefficients, the following weight proportions are obtained:



V

COMBUSTION

Considering now the weight of air theoretically necessary to secure complete combustion of the gasoline vapor, using as a basis one pound of gasoline and recalling that this substance is practically 83.7 per cent. carbon and 16.3 per cent. hydrogen, the following equations are obtained:



Total oxygen: 3.518 pounds of oxygen required to vaporize one pound of gasoline.

It must be remembered, however, that air is composed of approximately 23 parts of oxygen and 77 of nitrogen. Therefore the 3.518 pounds of oxygen theoretically required for the complete combustion of the gasoline is mixed with $\frac{77}{23} \times 3.518 = 11.774$ pounds of nitrogen. Hence theoretically about 15.3 pounds of air are necessary to secure the complete combustion of one pound

of gasoline. As a matter of fact, the air is never fully diffused through the gasoline vapor in the cylinder of an automobile and nearly 16 to 17 pounds of air are needed. At this point a maximum efficiency from the standpoint of gasoline consumption is secured. This air to gasoline ratio is, however, seldom maintained and whenever the maximum power of which the machine is capable is desired, the ratio of air to gas is dropped to 11.5 or even 10 to 1.

It may be seen that unless sixteen parts of atmosphere air are mixed with each part of gasoline vapor there will not be sufficient oxygen present for two atoms of that element to combine with each atom of carbon in the gasoline radicle. When sufficient oxygen is not present, each atom of carbon can unite with but a single atom of oxygen forming CO, carbon monoxid, which is given off in the automobile exhaust.

The problem of securing the best possible combustion, then, is in no small measure, to get at least 16 parts of atmospheric air thoroughly mixed with 1 part of gasoline before ignition takes place. The smaller the volume into which a unit volume of this explosive mixture is concentrated, the greater the proportional power of the motor.

One solution of the inter-related problem of fuel economy and power lies in increasing the extent to which the air and gasoline vapor may be compressed before ignition takes place.

American automobiles have as an average a compression ratio (the ratio of the total volume of the cylinders with the piston at the bottom of its stroke to the cylinder volume when the piston is at its highest point) of $3\frac{1}{2}$ to $4\frac{1}{2}$ to 1. Increasing the compression ratio from $4\frac{1}{2}$ to 1 to 7 to 1 would theoretically increase the efficiency of the engine about 25 per cent. (Ricardo).

As compression is increased not only is the ignition point of the fuel decreased, but the temperature of the gas-air mixture increased. Unfortunately then, there is a point beyond which compression in the cylinders cannot be carried before spontaneous combustion occurs. Many attempts have been made to decrease the reaction velocity of combustion of gasoline vapor in order that the cylinder compression may be increased, thus permitting a greater volume of air to be mixed with a unit volume of gasoline vapor before ignition takes place, thereby increasing

the efficiency and at the same time securing a reduction of carbon monoxid in the exhaust gas.

VI

COMPOSITION OF EXHAUST GAS

Unfortunately however, one hundred per cent. combustion of the hydrocarbons in gasoline is not attained even with the best possible adjustment of the carbureter and perfect timing of the spark. Depending primarily upon the care with which the carbureter is adjusted, the amount of carbon monoxid in the exhaust gases of an automobile may vary from slightly under two per cent. by volume to thirteen per cent. or even more. During the summer months when the air is warm, a unit weight of air will occupy a considerably greater volume; hence with the same carbureter adjustment, a smaller amount of oxygen will be sucked into the cylinder with a consequent greater percentage of carbon monoxid in the exhaust.

The amount of incompletely burned carbon increases rapidly as "a richer mixture," that is, a lower air-gasoline ratio, is used. This condition commonly prevails when the machine is being "warmed up" or when greater power is needed for hill climbing or heavy pulling.

A low air-gasoline ratio means, in addition to a greater volume of carbon monoxid in the exhaust, fewer miles per gallon of gasoline. In the United States where gasoline is relatively cheap, the mileage per gallon is of but minor import as compared with an engine that starts easily in any kind of weather and continues to run without requiring any attention or adjustment. In foreign countries where gasoline is almost a luxury, fuel economy is of vital importance. We are apparently satisfied with ten to twenty miles per gallon, and have almost persuaded ourselves into believing that is all we should expect. On the other hand, French economic tests showed a Voisin limousine weighing 5000 pounds ran 28.3 miles per American gallon, a Citroen car weighing 2500 pounds ran 53 miles, and a Petite Peugeot weighing 1200 pounds ran 76.9 miles per gallon. Assuming that the volume of carbon monoxid in the exhaust from any one of these French cars is as much as that from the average American automobile, it would appear that a French car which doubles and even triples the mileage, emits but one-half to one-third of the CO which

results from traveling the same distance in an American automobile.

The average composition of the exhaust gas by volume of 23 cars in this country is shown in the following table:

	On Level Grade Per cent.	Ascending 3 Per cent. Grade Per cent.
Carbon Dioxid	8.6	9.6
Oxygen	2.3	1.3
Carbon Monoxid	6.3	6.4
Nethane	0.9	0.6
Hydrogen	3.0	2.9
Nitrogen	78.6	79.2

There were 988 cubic feet of exhaust gas at 65° F. and 29.92 inches of mercury from one gallon of gasoline. From this it may be figured that there were 62.2 cubic feet of carbon monoxid; also that 29.5 per cent. of the total heat of the gasoline goes out in the exhaust in the form of combustible gases; and that if the completeness of combustion averaged but 70.5 per cent. for twenty-three American cars under common operating conditions, the loss of nearly one-third of the energy of the gasoline does not speak well for the efficiency of the automobile in this country.

At present, even the small cars produce as much as one cubic foot of carbon monoxid per minute while larger cars, trucks and buses produce much more. With the present design of engine exhaust this poisonous gas is discharged at the rear of the automobile about fifteen inches above the ground. As carbon monoxid has practically the same density as air (0.9678), there is but a very slight tendency for it either to rise as would hydrogen or settle to the pavement as does a heavy gas like carbon dioxid, another constituent of automobile exhaust.

It is of considerable importance therefore to know as exactly as possible what becomes of the carbon monoxid after it leaves the exhaust pipe of a gasoline driven motor vehicle.

VII

CARBON MONOXID IN STREET AIR

Under the direction of the Public Health Committee of the New York Academy of Medicine a series of observations were

made showing the distribution of the exhaust gas back of a car when standing still but with the motor running. It was found, as a result of observations made on a Ford car that the gas is distributed in a cone shaped space which spreads out so that the head of a person, of average height, standing a few feet back of the car was surrounded by an atmosphere containing from 4 to 6 parts of carbon monoxid per 10,000 of air.

A second series of observations were made upon cars travelling approximately ten miles per hour. Under such conditions the cone of exhaust gas is elongated and the occupants of a car following about 30 feet behind are surrounded by exhaust gas diluted to 1 or 2 parts of carbon monoxid in 10,000 of air.

Owing to the nature of carbon monoxid, that is, its density being practically the same as that of air, and the direction in which the exhaust is discharged from automobiles, the gas tends to hang in the street in a layer from 5 to 10 or at the most 15 to 20 feet deep. The concentration of the monoxid at a point the height of a man's head above the pavement depends largely upon atmospheric conditions. In a brisk wind, as might be expected, the dangerous fumes are more quickly diluted with fresh air and dissipated to higher elevations, but on the other hand, on damp days when the air is heavy and the wind velocity almost nil, high concentrations of this dangerous gas may be expected at points of heavy traffic.

With the facts established that carbon monoxid was to be found in the street air in the wake of an automobile whose engine was running, the next question was to determine the proportion of this gas encountered under different traffic concentrations with varying atmospheric conditions.

To this end a Ford car was equipped for the collection of samples. Two general types of samples were taken; those termed "snap" or "grab" samples of roughly a liter in volume, taking from 15 to 18 seconds to collect, and the composite sample to show average conditions over a quarter, half, or even three-quarters of an hour. In general an effort was made to obtain samples showing the conditions when traffic was light or of but moderate volume, and again when it was most dense, particularly during rush hours on clear windy days and also at times when the air was damp and still.

While the results vary, as may be expected according to atmospheric conditions and the amount and movement of traffic, the figures show conclusively that one part of carbon monoxid in 10,000 of air is a quite frequent condition in certain streets at certain hours and two parts are not unusual. An even greater concentration occurs in limited areas and for short periods. At times of moderate traffic on clear windy days, carbon monoxid is not present in sufficient quantities to constitute an appreciable health hazard. However, even at such times a stop behind several other cars resulted in the collection of samples of air containing a fairly high concentration of carbon monoxid. Almost without exception these relatively high concentrations were found immediately back of omnibuses.

Owing to their large motors with consequent high gasoline consumption and their frequent stops and starts, when an exceptionally large volume of carbon monoxid is produced, the omnibuses do more to contaminate the air with this dangerous gas than any other equal number of vehicles with the sole possible exception of large trucks.

VIII

REPORTED EFFECTS OF CARBON MONOXID IN STREET AIR

On damp still days the carbon monoxid content of the street air mounts, during heavy traffic, to a point where, according to Professor Yandell Henderson, a distinct health menace is created.

A number of writers have expressed the opinion that not a few automobile accidents have been caused by the mental dullness and inability of an operator to co-ordinate his movements in consequence of his being more or less under the effects of the carbon monoxid given off in the exhaust of the machines about him. Frequent references may be found to the headaches and dizziness of the occupants of automobiles caught in a long line of slow moving traffic. It is well recognized that with some individuals the eyesight and the co-ordination of muscular movements are affected by relatively minute quantities of carbon monoxid. A man who has inhaled such amounts of carbon monoxid as are present in garages is frequently affected by the same kind and degree of weakness of judgment and of accuracy of co-ordination as a man under the influence of a comparable amount of alcohol. Cases of

carbon monoxid coma caused by leaky exhaust heaters in closed cars have been recorded.

As a group, the traffic officers of large cities who are required to stand for hours at points of heavy automobile traffic, are those most likely to feel the effects of the carbon monoxid in the exhaust gases. Unfortunately there are practically no data available for New York City on the absenteeism or other conditions among traffic officers that may justly be attributed to monoxid. Certain information is, however, available from Chicago.

The results of an inquiry by City Health Commissioner Bundesen of twenty-five policemen at crossings in Chicago where automobile traffic is heavy, indicated that almost without exception, they complained of fatigue, dryness in the throat, headaches, and bronchial irritation, all symptoms distinctly indicative of carbon monoxid poisoning. It is quite significant in Dr. Bundesen's opinion that these officers seek living quarters in out-lying districts so as to be removed as far as possible from the automobile exhaust to which they attribute their discomfort. Many of these traffic officers stated that when on furlough the symptoms practically disappeared; but upon resuming duty, the distressing signs re-manifested themselves. They further stated they are not affected so severely in the winter, or when the wind is strong, but they feel the worst on hot humid days.

Dr. Shumway referring to conditions in Philadelphia states that the effect of automobile exhaust gases on the traffic policemen at busy places is well known. Dr. Hubley Owen, Chief Police Surgeon of Philadelphia, reports that traffic officers frequently complain of headache and nausea at the end of the day's work. "The foot-traffic patrolmen (at the ferry houses) complain of gastric disorders more frequently than the men from the districts. In many cases these symptoms have actually been so persistent that I have sent them to the hospital for gastrointestinal X-ray study, and gastric analysis. I find that these studies are negative, and that after the men have had a few days' rest from their traffic duties, their symptoms have been relieved."

That the policemen of New York City are no different as far as their ability to withstand monoxid poisoning from those in other cities is shown to some extent by an article published in the New York Sun, November 13, 1924, stating that figures in the traffic

department at Police Headquarters show that 100 out of 1200 men assigned to traffic duty are out each month because of illness much of which is of a bronchial nature. The same article mentions the headaches experienced by one of the traffic squad and comments that it is of the same type as that which the motorist experiences on Sundays when he crawls along at eight miles per hour in the wake of hundreds of other motorists "out for the air."

An article in the Tribune of December 21, 1924, states that the people of Paris are in revolt against the pollution of the air by automobile exhaust.

Dr. Shumway learned from the starter at the taxicab stand at the Broad Street Station in Philadelphia that when seven to ten cars are running the air is so bad that he goes home each day suffering from a headache, nausea, and a loss of appetite, which his physician cannot relieve. In the warm weather when the doors to the station are open many of the ticket sellers suffer from typical symptoms of chronic carbon monoxid poisoning.

The conditions at the taxicab stands under the Grand Central and Pennsylvania depots are particularly dangerous. At these points a considerable number of motor vehicles congregate with their engines running ready to "pick up a fare." The ventilation, particularly at the Grand Central Depot where there is a stand for a number of taxis under the main thoroughfare, is bad at times, especially on warm, damp days when the air is still; and there is every reason to believe that the carbon monoxid content of these vehicular subways must at times reach a concentration so considerable that exposure for as short a period as thirty minutes would be dangerous.

The ventilation of the New York-New Jersey traffic tunnel has been so designed that users of the tunnel will not be exposed to a concentration of more than 0.4 parts of carbon monoxid per 10,000 of air for more than thirty minutes. Many automobile engineers and other authorities fear, however, that a broken down truck or some similar accident will cause the carbon monoxid content of the tunnel air to exceed the danger point before the trouble can be corrected.

The danger of explosion of a gas tank following fire is recognized by those who have in mind the large number of automobile

fires which occur on the bridges over the East River and at other points not easily accessible to fire apparatus. It has been suggested as a means of materially lessening these dangers in the traffic tunnel, that the tunnel be provided with a moving platform, which will transport every vehicle from one end to the other. If this suggestion is adopted every automobile engine can be stopped the moment the machine is driven upon the platform. Thus carbon monoxid would be entirely eliminated, and the danger of fire greatly diminished.

If the number of automobiles continues to increase at the present rate it is estimated that New York will have more than 1,000,000 cars by 1930. If, by that time, definite action has not been taken to lessen the amount of carbon monoxid present in automobile exhaust the condition of the street air will be so bad that many people in the city may be dangerously poisoned.

As a general rule comparatively few small cars or electrically driven vehicles are seen upon Fifth Avenue in the vicinity of 42nd Street, consequently, with the knowledge we now possess of the amount of carbon monoxid commonly found in the exhaust of heavy cars and omnibuses, it is quite safe to assume that an average of at least 1.8 cubic feet of carbon monoxid is being discharged from each machine passing that corner each minute. On this basis the cars on Fifth Avenue alone are discharging every minute of the twelve hours between 7 in the morning and 7 at night, an average of between 48 and 50 cubic feet of this gas, more than 30,000 cubic feet in a day.

If there were no wind stirring to disperse the carbon monoxid from the exhaust of the motor vehicles passing this point, the air would be polluted to a point quickly fatal to life. Not less than twenty million cubic feet of pure air during the twelve daylight hours must be mixed with the exhaust if a serious menace to life is not to be encountered.

These rough estimates showing the volume of carbon monoxid frequently being discharged from the exhaust of automobiles at a point where the traffic is as congested as it is at 42nd Street, are based upon north and south traffic only. According to the police, traffic along the Avenue operates for but forty-two minutes (42) out of every hour. The crosstown traffic during the eighteen (18) minutes when the north and south traffic is

held up is considerable. The figures for the amount of carbon monoxid discharged into the street air at Fifth Avenue and 42nd Street could, in all probability, be increased by one-sixth without overstating the volume of CO that actually is present in the exhaust gas discharged between 7 a. m. and 7 p. m. on days of average heavy traffic.

IX

PROBLEM OF CARBON MONOXID IN GARAGES AND REPAIR SHOPS

The great danger of carbon monoxid poisoning from automobile exhaust gases in closed private garages has already been touched upon. In public garages conditions are less threatening to life, but undoubtedly more continuously inimical to health. The newer garages with their tight walls and ceilings are, on the whole distinctly dangerous from this standpoint. Present methods of artificial ventilation are far from effective for when an engine is run idle in testing and adjusting, or when cars move slowly in entering or leaving the garage, the exhaust gas is blown out in such a manner that it is rapidly mixed with the air of the whole, or at least a large adjacent portion of the garage. Forced ventilation, to be effective, should change the air of the garage every few minutes. In winter, when it is most needed, ventilation on such a scale is impracticable, for it would soon reduce the temperature of the garage nearly to that prevailing out-of-doors. The conditions obtaining in public garages have been studied by the New York State Department of Labor and by Dr. Alice Hamilton and others.

Very few of the large garages have any ventilation worthy of the name. In consequence of this, the typical carbon monoxid headache is a frequent and in some cases a daily occurrence with many of the employees.

In repair shops and assembling rooms the conditions are much worse. The answer to an inquiry made at one shop as to how many of the men go home with a headache was "Nearly all of them nearly every day, but we try not to run tests and make much gas until closing time." One assembling plant where engines are tested before being placed on the chassis is anxious to learn of some means of reducing the large amount of time which the employees lose from work on account of headache and nausea.

X

SMOKE AND ODOR NUISANCE

Motor vehicles are frequently responsible in varying degrees for still another form of air pollution along the highways, namely smoke and odor. This nuisance appears to become less noticeable from year to year. Formerly the majority of automobiles emitted evil smelling smoke from their exhaust pipes, but now the smoke nuisance is considerably reduced and the odor of burned oil is equally uncommon. Credit for this change for the better, is largely due to better automobile design. It is now generally recognized that not only is there no real need of having a smoking automobile, but that considerable smoke in the exhaust represents either careless, wasteful operation or an imperfectly designed machine.

It will be a difficult problem to eliminate the tarry soot that is commonly present as a by-product of the combustion of most of the gasoline now available. There is however, no reason why burned oil should be present to an appreciable degree in automobile exhaust.

Despite the great change for the better made in the past few years in the character of automobile exhaust from the standpoint of smoke and odor, there still remains room for improvement. The amount of smoke in the exhaust of any particular machine may appear small, but when combined with that from many other cars, the effect is noticeable.

There are laws in most states against discharging dense smoke from the exhaust pipe. The principle of such legislation is laudable, but enforcement for the most part is difficult and perhaps, therefore, lax. "Dense smoke," which is prohibited, is so hard to define that few courts will convict unless the exhaust is so bad that an intolerable nuisance has been created. The law has effect, however, in that the desire to avoid arrest has caused many to give more thought to their oil problem than might otherwise have been the case.

What steps may be taken to relieve the menace to life and health from the carbon monoxid in the automobile exhaust? The whole problem is difficult, but that for the repair shops and assembling plants appears to be easiest of solution.

It has already been noted that any attempt to change the entire air content of a building used for automobile assembling, testing and repairing as frequently as would be necessary if all health hazards are to be eliminated is out of the question. To heat the enormous volume of incoming air to a suitable degree would on cold days require an amount of coal or other fuel far beyond an economical point.

The solution of the problem for assembling rooms, repair shops, etc., would appear to lie in providing flexible ducts that might easily and quickly be attached to the exhaust of each engine being tested. These ducts should be under suction so that there may be no danger of the monoxid escaping into the work room. Numerous flexible ducts might well be connected into the main stack so that the gases together with the smoke and gases from the boiler room would finally be discharged above the building.

It is quite probable that the method finally adopted in repair shops and engine testing plants for eliminating or otherwise reducing to a minimum the carbon monoxid from the exhaust of automobile engines will not prove effective for storage rooms and similar places.

The danger of monoxid poisoning in garages and points where automobiles are stored and where there is frequent movement of the machines to and from the building can not be met in any such comparatively simple manner. The problem of such places differs from that of our highways in degree only and is not going to be met properly until the question of ridding automobile exhaust of carbon monoxid or discharging it in a manner not detrimental to animal or plant life has been solved.

XI

REDUCTION OF CARBON MONOXID IN EXHAUST GAS

There are five fairly distinct lines of procedure that suggest themselves for eliminating or reducing carbon monoxid in the exhaust: first by so adjusting the carbureter that this dangerous gas will not be produced; second, by securing a more intimate mixture of the air and gasoline vapor that the speed and completeness of ignition may be enhanced; third, by so designing the motor that a greater air to gasoline ratio may be used without material loss of power; fourth, by the development of a gaso-

line that will permit a higher compression ratio; fifth, having the outlet for the exhaust at a point where the street air will not be contaminated seriously; sixth, eliminating the monoxid after it has been produced, but before it is discharged into the open air from the exhaust pipe.

While it is theoretically possible to introduce enough air into the cylinder of an automobile engine to convert completely all the carbon in the gasoline vapor into carbon dioxid, it has not been found practically possible to accomplish this end. Careful adjustment of the carburetor to gasoline supply, spark timing and atmospheric conditions will in some carbureters secure a very high percentage combustion, but one hundred per cent. reduction of the carbon monoxid in the exhaust appears to be impossible of attainment. This is possibly due to the fact that the presence of carbon dioxid or even carbon monoxid itself retards the combustion of the latter gas.

The better design of carbureters can, however, be so adjusted that, under average operating conditions, but two (2) per cent. or even less of the exhaust gases is carbon monoxid. As a general experience, however, the motor vehicles in New York are discharging exhaust gases containing from six (6) to ten (10) per cent. monoxid or more. There is no excuse for the amount of this gas at any time exceeding six (6) per cent.

Even if one hundred per cent. combustion could be secured by adjusting the carburetor to care for one definite set of conditions, the least change in any of the several factors that are controlling will occasion some monoxid being produced. Changes in atmospheric conditions could be cared for readily, but the need for more power for hill climbing, pulling out of a bad spot, or for any other purpose that occasions a retarding of the spark and an increase in the gas supplied to the engine would, for the time being at least, vitiate the good results secured by hair-line adjustment of the carburetor.

There are two ways in common use for meeting this situation. One is to supply a choke to shut off the main air supply to the carburetor, thus enriching the mixture and the other is to provide a means of adjusting the carburetor from the dash or the steering post.

The dash adjustment can be made very simple in action if it is used correctly. Its use is easily understood, because its object is

to get it set to supply as "lean a mixture" as is possible. It can readily be told when it is too lean, for the engine will lose power and backfire through the carbureter. A proper dash adjustment set correctly for one speed and load will be correct for all speeds and loads at the same temperature. The carbureter will then need to be changed only as the temperature varies.

The mixture should be just right for a hot engine with the dash adjustment set at its leanest position. A carbureter adjusted for the maximum miles per gallon will deliver too lean a mixture to develop the full power of the engine. In general, the maximum mileage is secured when the air-gasoline ratio is approximately one to sixteen (16). At this ratio the amount of carbon monoxid in the exhaust is at its lowest point, being less than two (2) per cent. The brake horse-power is slightly over ninety-one (91) per cent. of the maximum that may be secured.

The point of maximum power appears to be reached when the air-gasoline ratio has been decreased to approximately twelve and six tenths (12.6). To secure this additional nine (9) per cent. of power, more than sixteen (16) per cent. of the possible mileage is sacrificed and the carbon monoxid in the exhaust gases increased practically two hundred to three hundred (200-300) per cent.

It will be seen then that even under present conditions a very marked and, from the standpoint of fuel economy, valuable reduction in the carbon monoxid content of motor exhaust gases may be secured by proper adjustment of the carbureter. The gain in power afforded by using a "rich mixture" is not great enough to be a legitimate excuse for the low air-gasoline ratio which is commonly used in a vast majority of automobiles in this country, and which is responsible for an inordinate amount of carbon monoxid in the exhaust.

The automobile owners and operators of the United States should be brought to realize that their desire to have an engine which will start promptly on cold days is, even with the present comparatively low price of gasoline, costing them many thousands of dollars each year. The demand for a quick starting motor is an important factor in the depletion of the available gasoline supply of this country.

In spite of the very frequent warning in the press that our known sources of gasoline may be exhausted within a quarter of

a century, there are but very few who appear to realize that they are playing an important part in this depletion of an invaluable national resource. If the price of gasoline were fifty or sixty cents a gallon, as it now is in England, the American public would be quick to learn more about the carbureters on their automobiles, and demand a less wasteful adjustment even at the expense of a little more time and effort in starting the engine.

It is not likely that automobile owners will of their own accord insure that the carbureter is maintained at a proper adjustment. Consequently as a health protective measure, legislation could be enacted or at least police regulations adopted to the effect that no automobile shall be operated upon the city streets, if the exhaust gases show a greater carbon monoxid content than four (4) per cent. by volume.

A few years ago, it would have been practically impossible to enforce such a regulation, owing to the difficulty of collecting samples of the exhaust for analysis, and the complexity of making the necessary tests. Recently, however, the Bureau of Mines of the Department of the Interior, has devised an apparatus that will give almost instantaneous readings of the CO content of air. It is felt that this machine will be developed to such an extent that it will show either on a dial or on a recording drum the carbon monoxid per cent. at any instant at any desired point. It should then be relatively simple to equip a police car with this apparatus and make determinations of the exact amount of monoxid present in the exhaust of any automobile which the police may feel is failing to keep within the limit set.

It would not take many fines to insure that practically every machine being operated in the city was complying with the law. It is also quite probable that instead of being just on the safe side, the average for all automobile exhausts would be as low as three (3) per cent. carbon monoxid.

More than carbureter adjustment should be considered, however, in order to secure a solution of the vital problems of eliminating or very largely reducing the carbon monoxid content of the exhaust from motor vehicles, and at the same time maintaining a high efficiency with a maximum of power.

It is a well-known and established fact that the efficiency of internal combustion engines increases with the compression

ratio. At first an increase in the compression ratio over that commonly in use secures a marked increase in efficiency. At a certain point, however, practically no increase in efficiency is obtained by a further increase in the compression.

Recently in an effort to develop a more efficient internal combustion engine detailed investigations were conducted of various catalytic agents to determine their serviceability for securing more complete and rapid combustion of the fuel mixture. Ultimately a catalyzer was found which when introduced into the cylinder head of a gasoline engine apparently causes a more intimate mixture of the molecules of the fuel vapor and the air, and at the same time owing to the high coefficient of radiation of this catalyzer it has the effect of increasing the volatility of the mixture to as great an extent as most preheating devices. As a result automobile engines treated with this agent appear to show a greater efficiency and a nearer coincidence of maximum power with the point of greatest fuel economy.

To secure a higher efficiency a greater number of the available heat units in the fuel must be utilized. This can not be accomplished unless the fuel mixture is more completely burned. As has been seen, complete burning of the gasoline would wholly eliminate carbon monoxid except of course the relatively small amount that may be occasioned by a breaking down of the carbon dioxid actually formed at the time of combustion. Hence any increase in engine efficiency from the thermal standpoint means a corresponding reduction of the carbon monoxid. It is therefore quite probable that some such agent may prove a large factor in the reduction of the CO in automobile engine exhaust.

One of the outstanding problems confronting automotive engineers in attempting to construct motors of greater economy is that of eliminating the "knock." Recent investigations of the detonation or "knock" in internal combustion engines, especially of the high compression type, has demonstrated that it can be practically eliminated by increasing the reaction velocity of combustion. It is known that the reaction velocity may be increased by adding small quantities of certain compounds such as alcohol, toluene, tetraethyl lead, etc., to the gasoline. This makes it possible to use engines of a higher compression ratio, thereby increasing the mileage per gallon of gasoline consumed.

Already a gasoline has been developed that, according to the inventors, with the type of cars in common use will give nearly twice the mileage per gallon of that secured from the regular grades of gasoline. It is felt that a smaller amount of carbon monoxid will be produced from a unit volume of such gasoline, but as yet studies have not been carried out to determine this point. However, even if the proportionate amount of monoxid is the same as produced by the standard gasolines the concentration at any point will be but approximately one-half that now encountered owing to its being distributed over roughly twice the distance.

It will be seen, therefore, that modification of the character of the fuel used in automobile engines may materially assist in reducing the carbon monoxid in street air. Changes in the gasoline used will probably lead to changes in engine design, which will still further assist in solving the problem of dangerous pollution in street air by automobile exhaust gases.

It has been suggested that the present location of the exhaust pipe near the ground at the rear of the machine is particularly menacing, and that automobile exhaust should be considered and treated in the same manner that smoke and gases from a furnace are handled.

The exhaust gases from automobile engines are far more toxic than the smoke which rises from the chimneys of dwelling houses or from the smoke stacks of most factories or the funnels of locomotives. In amount the total volume of automobile exhaust gas discharged even in a single street of New York City daily is not less than that of a large factory or power plant.

Henderson in a report prepared two years ago maintained that if the exhaust gas of automobiles constantly contained soot particles or what is termed "smoke" there would never have been any question that the automobile engine should be provided with a chimney. The exhaust gases being, however, nearly colorless, only slightly impregnated with finely divided and suspended soot, and comparatively free from odor, the practice of discharging the gases under or behind automobiles has become universal.

While this suggestion for chimneys for automobiles does not appear practicable, it is nevertheless fitting that it should be discussed in some detail before it is discarded as not being of the

character needed to relieve the problem that New York City must soon face.

If the engine exhaust were discharged above the heads of pedestrians the danger of monoxid poisoning would be greatly lessened. The movement of the motor vehicles would, of course, tend to suck a portion of the exhaust towards the pavement, but the tendency of carbon monoxid to rise, though slight (0.9678 to 1.0000) would help to counteract the suction of the machine. The gas being warmer than the surrounding air continues to rise while cool relatively fresh air drifts downward along the walls of the buildings beside the street to replace the rising gases from the machines. Thus at the same time, the exhaust gases are largely prevented from entering open windows.

Professor Henderson was of the opinion that a measure of amelioration would be secured if it were made a legal requirement that all trucks and omnibuses, all taxicabs and commercial vehicles, and all passenger cars with permanent tops discharge their exhaust gases through a pipe extending vertically upward for at least a few inches above the highest point of the roof. This suggestion has already been seized upon by a number of newspaper cartoonists as bizarre and a worthy object of humorous jibes.

Professor Henderson maintains that the benefits to be secured from vertical exhaust are not confined solely to street traffic. In private garages, owing to the natural tendency of the relatively warm monoxid to continue to rise, a ventilator in the roof immediately above the vertical exhaust will serve to remove the greater part of the gas before it can mix with the air in the room.

In the large public garages the problem of maintaining reasonably good ventilation without excessive costs for power and heat, now practically impossible of solution, will be greatly simplified. Exhaust gases discharged vertically rise to the ceiling and spread out in a stratum which scarcely mixes at all with the air below. Owing to its heat and consequent lightness it seeks any vent. Thus by providing a number of vents in the ceilings of buildings either with or without suction, the deleterious gases will for the most part be quickly removed.

Though the vertical exhaust pipe may help, it does not appear to be a good solution of this intricate problem. Certainly,

if future studies prove that it is automobile exhaust that is deleterious to the foliage of the city trees and shrubs, the vertical exhaust will not help this situation. At its best the carbon monoxid is not lessened but merely carried to a point where the atmosphere is less apt to be affected.

The possibility of reducing the carbon monoxid content of the exhaust as it leaves the engine cylinders but before it is discharged into the open air should be considered. Naturally, the first line of attack that suggests itself is to convert completely the CO in exhaust gases into CO_2 .

The statement that carbon monoxid and oxygen when heated combine to form carbon dioxid must be qualified as it is not strictly true. Certain experiments conducted in Germany have shown that perfectly dry carbon monoxid mixed with pure dry oxygen does not ignite to form the dioxid. This fact, however, need not be considered in the present question, as one of the products of the combustion in the cylinder is water, and water vapor is therefore present to a great extent in the exhaust. In fact, it is steam in the exhaust that many mistake for thin white smoke.

For other reasons, however, it is out of the question to collect the exhaust in any chamber, add more air and with the aid of a spark or even a continuous flame, hope to convert the carbon monoxid into carbon dioxid.

The main difficulty is that the amount of the monoxid in the exhaust is relatively very small. It is mixed with a large volume of nitrogen which being an inert gas is still present in the exhaust as nitrogen, with considerable carbon dioxid and with water vapor. Adding more air to the exhaust to supply oxygen so that the combustion of the monoxid may be completed will merely serve to dilute the gas with nitrogen to a still greater extent.

Other means must be sought for reducing the carbon monoxid in the exhaust.

There are two general procedures that may be considered for this purpose. Either the gas may be absorbed as carbon monoxid or some catalytic agent introduced into the exhaust pipe that will convert the monoxid into the dioxid without itself entering into the reaction.

Considering the possibility of absorbing the gas, it is known that at a dull red heat a unit volume of iron absorbs 4.15 vol-

umes of the monoxid. One volume of wood charcoal will absorb 21.2 volumes of CO, while a solution of cuprous chloride in hydrochloric acid readily absorbs the gas. It will be seen that none of the substances readily available absorbs a sufficient volume of the monoxid to warrant its use in automobiles. Even if an agent were available that would readily take up large volumes of this gas, its use would be of doubtful value. It would require undue police supervision to insure that automobile operators replaced the absorptive agent whenever it needed replenishing and did not attempt to drive their machines when the monoxid gas could no longer be taken up, but was being discharged into the open air. Again it is enough of a duty to have to fill the gasoline tank and most automobile owners would consider it a hardship to have to recharge a container for getting rid of an unseen thing that to date has not entered their minds. The fact that some method of disposing of the spent charges must be found should not be lost to sight. The objections to the suggestion of absorbing the gas by some agent are so great that it may be discarded.

Practically, then, the question of reducing the carbon monoxid now present in automobile exhaust has been brought down to the question of whether some catalytic agent may be employed that will complete the combustion started in the engine cylinder.

The solution of this question rests in the hands of expert chemists and automotive engineers. Some substances are already known that will secure the catalysis of carbon monoxid to carbon dioxide, but the feasibility of their use has not been fully ascertained.

Spongy platinum at a dull heat in the presence of air will rapidly catalyze carbon monoxid. Platinum is a rare element that is already beyond the purchasing power of most people and its general use in automobile exhaust pipes is therefore impracticable.

A mixture of carbon monoxid and hydrogen when passed over finely divided nickel forms methane and carbon dioxide, the nickel not being affected. Such means of ridding the exhaust of CO is, however, barely worth consideration. In the first place, methane is as highly objectionable as carbon monoxid from many standpoints; also to require every automobile to be provided with a cylinder of hydrogen would be ridiculous.

A heated palladium wire will readily convert carbon monoxid and oxygen (air) into carbon dioxid at 300° . Palladium is also expensive and "something just as good" will have to be sought. Gold and silver wires have already been tried, but they fuse without causing the gases to unite and hence cannot be employed.

So far efforts of chemists and automotive engineers to find a catalyzer suitable for converting the carbon monoxid in automobile exhaust gases into carbon dioxid have failed owing largely either to the great cost of the catalytic agent, or to the fact that the small amount of tar in the exhaust is deposited on the catalyzer rendering it ineffective. This line of search, however, has not been exhausted, and it is to be hoped that further studies will develop a satisfactory catalytic agent that will obviate the difficulties now encountered.

XII

SUMMARY

1. In spite of the great amount of study given to carbon monoxid and its effects upon life, there is no agreement among investigators as to the fundamental nature of the problem. One group maintains that the poisonous manifestations of the gas are due solely to oxygen deprivation caused by the affinity of CO for hemoglobin, while another holds that the gas has a specific toxic action on the nerve tissues and cells. Some claim that the gas is promptly dissociated or thrown off by the hemoglobin as soon as the individual breathes pure air; others feel that the combination of carbon monoxid and hemoglobin is a stable compound that is never broken down and is not discharged until the blood corpuscle meets its death. Whether CO poisoning is cumulative in its effects is a matter of question. The weight of present day opinion is in favor of the point of view that the poisonous manifestations of the carbon monoxid are due solely to anoxemia.

2. The effects upon the human system of frequent exposure to very low concentrations of carbon monoxid in the inspired air need detailed study. The many now disputed questions as to the action of the gas require settling, particularly in relation to the pollution of the air by the automobile exhaust gas.

3. The studies for the Public Health Committee of the New York Academy of Medicine by Professor Yandell Henderson

show that under certain atmospheric conditions, when little breeze is stirring and traffic is heavy, the carbon monoxid content of the street air in New York City reaches a point where prolonged and continuous exposure to it may have deleterious effects.

4. The present percentage (from 7 to 14 per cent.) of carbon monoxid in automobile exhaust gases is unnecessarily high. A high content of this gas represents a heavy sacrifice of miles per gallon for the sake of power and ease in starting a cold motor. Ample power may be had from any machine from a CO content of but three per cent. by volume of the exhaust gases, and the present average content of over seven per cent. is wasteful.

5. Motor fuels have been developed that are said to give nearly double the mileage per gallon. Even though the same volume of carbon monoxid may be given off from a unit volume of such gasoline, its effect upon the street air will be much reduced, owing to its being exhausted over a greater distance.

6. There is, of course, the possibility that some catalytic agent may be developed which will cause the carbon monoxid of the automobile exhaust to be converted in the presence of oxygen into carbon dioxid, a relatively harmless gas. There is, likewise, a probability of utilization of fuel other than gasoline for internal combustion engines.

7. There is need of effective safeguarding of the health of those exposed to the dangers of carbon monoxid in industry and elsewhere by state and municipal authorities.

The Sub-Committee

JAMES B. CLEMENS, M.D., Chairman

W. GILMAN THOMPSON, M.D.

LIBRARY NOTES

PARIS THESES

The Paris Theses for the school years 1924 and 1925 are now in the library and are available for reference.

TWO VALUABLE ACCESSIONS

Through the generosity of a group of the Fellows of the Academy we have recently been enabled to purchase a copy of the first

edition of one of the greatest medical books, that is, "*De medicina libri octo*," by Aurelius Cornelius Celsus, Florence, printed by Nicolaus Laurentii, 1478. This particular copy is not absolutely perfect, but we are lucky to find one at all. Already, a Fellow of the Academy has offered to take the book over from us should we become the possessors of a better one.

We know little of Celsus except that he lived in the Augustan age and in all likelihood was not a medical man. "He probably intended his treatises on agriculture, medicine, war and rhetoric to form a compendium of all knowledge requisite for a wealthy citizen, who had a farm and slaves to superintend, and might hold a public office" (Withington). The manuscript of Celsus was not brought to light until the fifteenth century.

Celsus gives a good outline of the history of medicine up to his time, mentions many physicians whose writings are now lost and tells us the state of Roman medicine of his period. Garrison praises especially the descriptions in Book II of abnormalities of the urine, symptoms of stone in the bladder, prodromata of insanity, and symptoms of the last stages of consumption.

All the Fellows of the Academy, we feel sure, are grateful for the present of this incunabulum.

A bibliographer has been described as "one who copies other peoples' mistakes and adds to them himself"! This is a rather harsh description as can be readily proved by a look at John Ferguson's "*Bibliotheca Chemica, a Catalogue of the Alchemical, Chemical and Pharmaceutical Books in the Collection of the late James Young of Kelly and Durris, Esq., LL.D., F.R.S., F.R.S.E.*," Glasgow, James Maclehose and Sons, 2 vols., 1906. A copy of this book has recently been very generously donated to the Academy by the "trustees and family of the late Dr. James Young of Kelly" and it stands as a shining example of what a bio-bibliography, or catalogue raisonné, should be. The choice collection of about 1,400 books listed alphabetically under author was made by Dr. Young (1811-1883), who was a native of Glasgow, studied chemistry under the famous Graham and later "came to be the originator of the paraffin oil industry in Scotland." Young, before he died, established a chair of technical chemistry in Anderson's College and bequeathed this library to this chair.

Professor Ferguson, who died a few years ago, was Regius Professor of Chemistry in the University of Glasgow. He has dealt fully with each author and each work and details of the life of the man and the lives of his books are given in notes. These volumes are tools which the medical bibliographer should be proud to possess.

The volumes were printed for private distribution and in paper and typography are as handsome as well could be. Each volume contains as frontispiece a photogravure of James Young.

A. M.

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elected a Fellow of the Academy March 3, 1904; died June 20, 1926. Dr. Howland was a Fellow of the American Medical Association, and a member of the Pediatric Society.

Bernard S. Talmey, M.D., 155 West 118th Street, New York, N. Y., graduated in medicine from the University of Munich, Germany, 1892; elected a Fellow of the Academy May 3, 1906; died June 30, 1926.

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TABLE OF CONTENTS

Editorial:

Laennec: FIELDING H. GARRISON	389
-------------------------------------	-----

The object, future development and financial needs of the Academy	394
--	-----

Announcement:

Increased endowment needed	400
----------------------------------	-----

Public Health Relations Committee:

Carbon monoxide poisoning	402
---------------------------------	-----

Library Notes:

Paris theses	440
--------------------	-----

Two valuable accessions	440
-------------------------------	-----

Recent accessions to the Library	442
--	-----

Deaths of Fellows of the Academy	446
--	-----

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THE NEW YORK ACADEMY OF MEDICINE

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EDITORIAL

THE HISTORY OF CANCER

The concept of cancerous or malignant growths is undoubtedly very old. In Exodus IX, 8-11, we already find, in the account of the sixth Egyptian plague, an adumbration of soot or chimney-sweep's cancer:

8. And the Lord said unto Moses and unto Aaron, take to you handfuls of ashes of the furnace, and let Moses sprinkle it toward the heaven in the sight of Pharaoh.
9. And it shall become small dust in the land of Egypt, and shall be a boil breaking forth with blains upon man and upon beast, throughout all the land of Egypt.
10. And they took ashes of the furnace, and stood before Pharaoh; and Moses sprinkled it up toward heaven; and it became a boil breaking forth with blains upon man and upon beast.
11. And the magicians could not stand before Moses because of the boils; for the boil was upon the magicians and upon all the Egyptians.

The eminent Orientalist, Paul Haupt, regards these blains or ulcers as of the tropical or endemic variety, but inasmuch as endemic ulcers are now viewed as parasitic infestations (cutaneous Leishmaniasis), the simpler interpretation, viz., that the Hebrews may after all have noticed soot-cancer in furnace-tenders, has some weight. The Hebrew and Syriac expression for cancer is *sartân*, which is identical with the Arabic *saratân* (a crab). Cancer is also designated in mediæval Arabic as *âkilah*

(rodent). In II Timothy, 2, 17, we read: "And their word will eat as doth a canker" (*gangraena*).

Malignant tumors are mentioned in the Ebers Papyrus. The ulcerating forms were treated with an arsenical paste, used as "Egyptian ointment" up to the 17th century. In a cuneiform inscription from Nineveh (800 B. C.), cancer of the breast is termed *machsû* (Oefele). The Ramayana of ancient India refers to the treatment of malignant tumors with the knife and the arsenic paste. The cautery was later employed.

Hippocrates was the first to employ the terms "cancer" and "carcinoma" as designating benign and malignant growths respectively. He also differentiated between "scirrhus" and "carcinoma" as hard and ulcerating types of cancer. (Aph. VIII, 138.) The Hippocratic canon contains references to cancer of the breast and stomach (*melaena*), scirrhus of the cervix uteri and extirpation of a cancer in the neck by the cautery. Celsus diagnosed cancer by its recurrence after cauterization, which engendered the later witticism of Duparque: "Cancer is incurable because it cannot be cured; if curable, it is not cancer." Celsus further differentiated cancer from lipoma, atheroma, steatoma, stressed the involvement of the axillary glands in mammary carcinoma, and described an operation for cancer of the lip. Galen described cancer of the breast as resembling a crab, was aware of metastases, and therefore recommended total removal of all ramifications when knife and cautery were used. He described sarcoma as a growth having the appearance of raw meat (*sarkos*). He was the first of the long line of theorists as to the causation of cancer, which he ascribed to excess of black bile. The hypothesis held the field until the 17th century, when it was displaced in succession by such theories as those of sour lymph (Descartes), inflammation (Boerhaave), acidosis vs. alkalosis (Sylvius), stasis of blood and lymph (Hoffmann), lymph stasis (Monro), coagulated lymph (John Hunter) and so on up to the time of Bichat, Laënnec and Cruveilhier. Meanwhile there was much sound sense in the elder surgeons. Albucasis enlarged upon the impossibility of curing an old, established cancer by the knife or otherwise. Saliceto called such a tumor *noli me tangere*, because "the more you interfere with it the worse it becomes." Lanfranc proclaimed, with true surgical

insight, that "it can only be cured by entire removal, *along with its roots*," the rationale of the block-dissections of Halsted and Wertheim. Guy de Chauliac saw ulcerating cancer as sometimes due to irritation of chronic ulcers, and used caustics or arsenious acid to test the cancerous nature of suspicious growths *viâ* recurrence. Fabry of Hilden cleaned out the axilla in mammary cancer with knife and ligatures. Paré described the breaking down or ulceration of cancerous tissue, stressed the frequency of the disease in women, and, as one of the first to write on medicine in the vernacular, introduced the term "*chancre*," which, in the case of the venereal ulcer, conveys a picture of ulcerating cancer *en miniature*.

The advent of Bichat marks the beginning of the long welter of theorizing and controversy as to the histological origins of cancerous tumors, which was to cover the whole of the 19th century.¹ Bichat saw his 21 different tissues as "cellular," in the vague sense in which the 17th century microscopists, Hooke, Malpighi and Grew, had seen the walled-off spaces or "cells" in cork and green plants. He first described the lobular nature of cancer, ascribed it to proliferation of connective tissue (*tissu cellulaire*), and differentiated between its parenchyma or nutritive base and its stroma or degenerated element (1801). In contrast with these far-reaching intuitions stands his vivid account of scirrhus: "*Il crie sous le scalpel*." Laënnec (1804) and later Lobstein (1829) differentiated homoöplastic and heteroöplastic tumors. Laënnec first described schirrus as being, not a pre-cancerous condition, but a distinct and definite connective tissue growth. At this time, cancer of the breast was closely studied by Lobstein, Cruveilhier, Velpeau, Astley Cooper and others. Meanwhile, the cell-theory had been established by Schleiden (1838) and Schwann (1839) and had been already applied to tumors by Johannes Müller (1838), who, with the insight of true genius, attributed cancer to new specific cell formation within the connective tissue of an organ, with pro-

¹ For a full account of these theories and controversies, see Jacob Wolff's exhaustive and accurate monograph "*Die Lehre von der Krebskrankheit*" (Jena, 1907). If the actual history of medicine were written out in this detailed and documented manner, it would occupy (shall we say) a hundred stout volumes.

found affection or infection of the whole system. He was the first to demonstrate nuclear epithelium in cancerous tissues. A lively hunt for specific cancer cells ensued, and the introduction of the term "caneroid" by Hughes Bennett (1847), for growths devoid of such cells, added to the confusion. In the same year (1847), von Bruns stressed the rôle of the lymphatics in spreading cancer by metastases. Epithelioma was described and named by Hanover (1852) and cylinder-epithelial cancer by Bidder (1852). Meanwhile, Remak had established the growth of new tissues by the division of pre-existing cells (1841-52), and this was applied to pathological formations by Virchow, who described first caneroid (1853), and later cancer and heteroplastic tumors (1885) as proliferations of connective tissue cells, due primarily, both in cancer and its metastases, to some irritating element or secretion. Virchow's theory of cancer was modified by Thiersch (1865) and Waldeyer (1872), who established the primacy of epithelial proliferation in both epithelioma and carcinoma. The dynamic phase of Virchow's doctrine (chronic irritation) has remained unassailable to date, and is, indeed, borne out all along the line by such data as we find in chimney sweep's cancer (Pott, 1775), cancer of the mouth in smokers or betel-nut chewers, of the stomach in gastric ulcer, of the gall-bladder in biliary calculus, of the abdomen from the kangri baskets carried by charcoal burners in Kashmir (Neve, 1910), cancer in aniline workers, X-ray operators and mull spinners (Leitch), in horses and draught cattle from chafing by ropes or harness, and experimental cancer from injection of tar (Bayon, 1912) or other irritants. The theories of Thiersch (disturbance of equilibrium between epithelium and connective tissue) and Waldeyer (replacement fibrosis of ageing epithelium) were subjected to further modifications by Hauser (1890) and Hanse-mann (1902). About 1872-5, Cohnheim's view of a congenital foundation or *Anlage* for cancer in the shape of displaced embryonal rests, began to dominate the field. Askanazy's modification of Cohnheim's view was "embryonic cells isolated in space and time." Cohnheim's theory was further modified by Ribbert (1904-11) to the effect that undifferentiated epithelium, whether of embryonic or of extra-uterine origin, may proliferate into cancer through an inherent power of compensatory hyper-

trophy (Weigert's law), without reference to external stimuli.² With the study of the splitting or reduction of chromosomes in the nucleus of dividing cell or fertilized ovum, controversy was shifted to mitotic processes in the nucleus of the cancer cell. Perhaps the most extraordinary theory advanced was that of the late Dr. A. F. A. King, of malarial fever fame. In 1913, he maintained that proliferation of cancerous tissues is due to the actual fertilization of normal epithelial cells by wandering spermatozoa!

Up to the very end of the 19th century, then, investigation of cancer had remained in the descriptive, static, theoretical or controversial stage, and was therefore at a standstill. The various theories of bacterial or parasitic origin amounted to nothing, and the only real advance was in the extended lease of life under surgical treatment, from the four months allotted by Paget to the five years gained by such block-dissections as those of Halsted, Crile and Wertheim. The experimental or forward-moving phase of cancer investigation is largely the work of the 20th century.³ Dupuytren's experimental injections of cancerous material (*circa* 1807) were negative and negligible, and the Society for investigating the Nature and Cure of Cancer founded in 1802 by Matthew Baillie, Home, Abernethy and others was equally unfruitful. In 1889, Arthur Hanan, of Zürich, made the real start in experimental transplantation of epithelioma in white rats, but his work, although preceded by Novinsky (1876), Wehr (1878), Cornil and others, remained unrecognized until its confirmation by Moran (1894) and Borrel (1903), and he committed suicide from disappointment. Inoculability of sarcoma in rats was established beyond doubt by Leo Loeb in America (1901) and Jensen in Denmark (1903), who carried rat-sarcoma through 19-40 generations of rodents without change in microscopic structure. During 1900-1921, many societies and periodicals for the collective investigation of cancer were estab-

² In 1876, the brilliant and short-lived Franz Boll (1849-79) had stated that all tissues possess, in themselves, the spontaneous capacity of proliferating into pathological processes. What he missed was the pseudo-embryonic character of these processes.

³ For two extended articles on recent work, see Krumbhaar: *Ann. Med. History*, N. Y., 1925, VII, 132-140 and Bayop: *South African Med. Rec.*, Cape Town, 1925, XXIII, 522-536.

lished all over the world. Ehrlich (1906) demonstrated that rat and mouse cancer are specific for these animals by zigzag transplantations from rat to mouse and *vice versa*. In 1911-14, Peyton Rous demonstrated the specificity of sarcoma in the mesoderm of Plymouth Rock chickens by experimental transplants and inoculation of cell-free filtrates. Extravital cultivation of malignant tissues was established by Carrel and Burrows (1911), extended to an indefinite period by feeding the culture with chicken muscle by A. Fischer (1925), while Drew showed that malignant tumor cells produce a growth-inducing substance (Carrel's trephone), as in the case of injured normal cells. The demonstration of the effect of scarlet-red and other dyes on tissue-proliferation by B. Fisher (1906), led Bayon (1912), Yamagiwa and Ichigawa (1916), to the experimental production of epithelioma in rabbits by injections of tar products, while Leitch produced carcinoma, epithelioma and sarcoma in laboratory animals by potassium arsenite, paraffin and other "carcinogens." X-ray cancer, while frequent in man, only occurs in laboratory animals after prolonged exposure (Pierre Marie). The effect of nematode worms in the development of malignant tumors was first noticed by Borrel (1910) and was carried to triumphant demonstration by Fibiger under conditions of tremendous difficulty (1914). He identified the nematode (*Spiroptera neoplastica*) by constructing a model from serial cross-sections, eventually found the host of the parasite (*Periplaneta orientalis*) in a sugar refinery, which burned down, and could only keep his experiments going by feeding cockroaches with ova and rats with the infested cockroaches. More than half his rats developed carcinoma with metastases. In like manner, Bulloch and Rhodenburg got sarcoma in rats, by feeding with *Cysticercus fasciolaris*. Leitch produced cancer of the gallbladder in a guinea-pig by insertion of human gallstones. All these experiments confirm the Virchow theory of irritation. Resistance or immunity against second inoculation is induced by successful inoculation and can be stimulated by radiation. By careful selective breeding, Maude Slye has produced generations of mice that are absolutely resistant or particularly susceptible to cancer. Resistance appears to be the Mendelian dominant, susceptibility the recessive. Murphy's experiments (Rockefeller Institute) seem to show that resistance to cancer depends upon lympho-

cytosis; and that such lymphocytosis may be promoted by gentle X-ray stimulation and destroyed by strong stimulation. A chick-embryo may be rendered as resistant to a grafted tumor as an adult by feeding with lymphoid tissue and cancer grafts will not grow upon areas in adult mice which have been previously exposed to an erythema dose of X-rays. This suggests the rationale of radiotherapy in cancer. Lazarus Barlow has formulated the theory that squamous-celled carcinoma yields best to small doses of radium over large stretches of time and columnar celled carcinoma to large doses over short intervals of time ($D = Q \times t$).

We think of cancer as a malignant anti-social proliferation of pseudo-embryonic cells at the expense of the rest of the organism. In the end, this process does not differ in appearance from ordinary granulating tissue, as Virchow originally noted. Thus the net result of a hundred years of pathological theorizing points to a bio-chemical (virtually infective) process,⁴ not of orthodox type, but of the filterable virus type of smallpox, rabies, trachoma or serpent poisoning. Such viruses, as maintained by Ehrlich (atrepsey), and proven by Kyes, are resolvable into two or more components, innocuous in themselves, but capable of producing infection when combined. Upon this hint, Gye and Barnard have apparently obtained two such negative components of the Rous chicken sarcoma virus by (1) killing a cell-free filtrate with chloroform and (2) by allowing a "primary culture," obtained by diffusion, to stand until its potency is *nil*. Combined, these two negatives produce a positive result, whence it is inferred that the inert primary culture contains the basic virus and the chloroformed filtrate a specific chemical substance necessary to nourish the virus and peculiar to the particular type of tumor. If this be true, then all malignant tumors have an identical virus and differ only in respect of specific nutritive activators. Even so, it is still a far cry from mouse sarcoma to cancer in human beings. Photography of "germs" is of secondary importance, and judgment must be suspended. But, in these experiments we have undoubtedly a new departure, which, if shown to be viable, will be a brilliant confirmation of the reasoning on Ehrlich's Harben Lectures of 1907.

F. H. GARRISON

⁴ In 1912-14, von Behring indicated that pathological processes in poisoning and detoxication are analogous to, if not identical with those in infection and immunity.

ABSTRACTS OF PAPERS DELIVERED BEFORE
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THE SIGNIFICANCE OF THE LEUCOCYTE COUNT AS
AN INDEX OF THE RHEUMATIC INFECTION AS
MANIFESTED IN CHILDREN

MAY G. WILSON, M. KOPEL

The determination of the onset, degree of activity, duration and quiescence of the rheumatic infection is of practical importance in diagnosis, prognosis and treatment.

The leucocyte count is taken as an index of infection in many diseases.

In this investigation an attempt has been made to evaluate the significance of the leucocyte count as an index of infection in children exhibiting the varied manifestations of the rheumatic infection.

The ages of the children ranged from 4 to 15 years. In all a total of 384 leucocyte determinations on 88 cases are included in this study.

The leucocyte count in children exhibiting the following rheumatic manifestations were studied:

- 1—Acute and subacute rheumatic fever with arthritis and fever.
- 2—Active chorea.
- 3—Recurring growing and joint pains (without fever or arthritis).
- 4—Rheumatic heart disease.
 - a—Potential cardias (history of previous rheumatic infection).
 - b—Chronic cardio-valvular disease.
 - 1—Class I (normal exercise tolerance as indicated by normal vital capacity).
 - 2—Class II A (slightly diminished exercise tolerance as indicated by vital capacity — 10 to 25 per cent.).

Class II B (greatly diminished exercise tolerance as indicated by vital capacity — 25 to 35 per cent.).

3—Class III (Cardiac failure as indicated by symptoms, physical examination and a vital capacity of —30 to 70 per cent.).

Averages of the leucocyte count obtained for each symptom group were computed. Frequently the same case will be present in more than one group with more than one count.

Leucocyte curves of individual cases observed for periods of a year or more were also included for analysis.

RESULTS

A comparison of the individual and the average leucocyte counts obtained for each symptom group is of interest. These findings may be summarized as follows (See Chart I):

For 16 cases with acute and subacute rheumatic fever (with arthritis) the average leucocyte count was 13,200. The range was from 8,000 to 23,200, 91 per cent. of the counts being above 9,000 cells. Salicylates in the usual dosage tended to lower the leucocyte count but did not bring it down to normal at the height of the infection. Here the degree of leucocytosis seemed to be proportional to the febrile reaction.

For 14 cases with active chorea, the average leucocyte count obtained was 10,700 with a range of from 8,900 to 13,200 cells, 94 per cent. being above 9,000.

For 25 cases with an immediate history of recurring growing and joint pains (without fever, above 99° or evident arthritis), the average leucocyte count was 10,000 with a range from 5,800 to 14,900; 68 per cent of the counts being above 9,000 cells. Salicylates brought the count down to normal in many cases. The average count with salicylates was 9,000 compared with an average of 10,800 for those not receiving salicylates. In many of these cases arthritis and carditis intervened during the period of observation. Frequently the moderate leucocytosis observed in cases with growing and joint pains was the only indication of the infectious nature of these symptoms.

Leucocyte Count in Children with Rheumatic Heart Disease:

The average leucocyte count for 16 cases of the potential group was 7,000 with a range of from 5,200 to 8,500 cells, 100% being below the upper limit of normal.

The average leucocyte count for 37 cases of chronic cardio-valvular disease (Class I) was 7,700 cells, with 93% of the counts below 9,000. The range was from 5,200 to 9,900 white blood cells, with 2 cases showing counts of 14,000 and 13,000 cells, respectively.

The low average leucocyte counts observed in these two groups were confirmative evidence of the quiescence of the infection as determined by clinical history, physical examination and vital capacity measurement.

These average counts may also serve as control counts, indicating the upper and lower limits of normal.

The average leucocyte count for the 12 cases of rheumatic heart disease (Class II A) was 9,700 cells with 67% above 9,000, the range being from 5,000 to 15,000. These cases were afebrile, 6 cases had persisting rheumatic nodules. The majority of the cases were convalescing from a recent carditis. In a few cases the increased leucocyte count was the first evidence of the ensuing rheumatic arthritis or carditis.

These groups comprise the types of cases in which it is most difficult, on physical examination alone, to determine the activity or quiescence of the rheumatic infection.

The average leucocyte count for 10 cases with chronic cardio-valvular disease (Class II B) was 10,900, 86% being above 9,000 cells, with a range from 5,200 to 16,800. All of these cases were convalescing from a recent carditis. The associated symptoms of active infection were nodules, pallor and a low grade of fever 99 to 100°.

In this group the leucocyte count is of prognostic value, indicating the persistence or quiescence of the infection.

The presence of a low leucocyte count in some instances, despite the presence of other evidence of activity, is to be noted in passing.

In 15 cases with carditis (Class III) the average leucocyte count was 14,300 with a range of from 5,100 to 25,000 cells, 94% being above 9,000. These cases had definite signs of cardiac failure; *i.e.*, dyspnea, orthopnea and in some cases edema. Other symptoms of infection were fever 100 to 103°, nodules and pallor.

The leucocytosis here observed is confirmatory evidence that the symptoms of cardiac failure in childhood are due to active

infection of the myocardium rather than mechanical cardiac disablement.

A further comparative analysis of the average leucocyte count for each symptom group is of interest. (See Chart 2.) Here it may be seen that the highest leucocyte counts were observed in the cases with carditis, the lowest in the cases with recurring growing and joint pains. The average counts for cases without clinical symptoms of activity were within the normal range.

If the grade of leucocytosis may be considered as an index of the degree of infection, these data would indicate that the most severe infection was present in the patients with carditis and a mild infection in patients with growing and joint pains. Such an inference would be in accord with the clinical course of the cases observed.

CONCLUSION

Repeated leucocyte counts in children with rheumatic infection would seem to be of some clinical value in diagnosis, prognosis and treatment.

CERTAIN OBSERVATIONS ON THE COURSE OF RHEUMATIC HEART DISEASE

JOHN WYCKOFF

This paper reports certain observations made during the past six years on the natural history of patients suffering from rheumatic heart disease. The results of an analysis of carefully recorded case histories of 50 patients who had been under observation at the Bellevue Cardiac Clinic are reported and such observations compared to observations made upon morbidity statistics from the same clinic.

It was shown in these 50 cases that during the time from first rheumatic infection to death 55.9% of such time the patients were free from cardiac symptoms, 38.4% of the time they had symptoms but not so severe as to wholly incapacitate, and 5.7% of the time the patients were wholly incapacitated. In the time from the first known heart involvement on the part of the patient to death, 33.5% of the time the patients were without symptoms,

51.8% they had symptoms but not so severe as to wholly incapacitate them, and 8.6% they were in complete failure.

It was shown that in 50 cases followed to death 21, or 42%, developed auricular fibrillation at varying times between a few days and six years before death.

Of the patients dying 98% died before the age of 50. The mean age of death of the sample was 29.1 years. This age incidence of death was compared with three other samples of age morbidity rate which the author has observed, and though the percentage of deaths after 50 is undoubtedly extremely low, all other samples seemed to show that less than 10% of patients with rheumatic heart disease live past their fiftieth year.

A chart showing graphically the incidence of rheumatic infection and auricular fibrillation in these cases was shown, and it was demonstrated that the 50 patients fall into four clinical groups.

Group I. Acute, active fulminating.

Cases who die during the first attack of carditis, consisting of 4% of the total.

Group II. Subacute, or chronic active.

Cases who show constant signs of activity for years—14% of the total.

Group III. Recurring rheumatic carditis.

Characterized by periods of activity at frequent intervals, but definitely inactive between times—12%.

Group IV. Inactive rheumatic carditis.

Cases which after an initial active stage become inactive and stay that way for years, sometimes until death (64% of the cases). This group is subdivided into a subgroup A in which the initial activity is comparatively short lived (58% of total) and a subgroup B in which it lasts several years before coming inactive (6% of total). Three cases, or 6%, it was impossible to classify.

Charts were shown which demonstrated that one of the factors in reducing longevity in chronic rheumatic heart disease was the persistence of activity, and also that the age of the first infection had no influence as to whether the activity would persist or become quiescent.

The cause of death of the 50 reported cases was as follows:

USE OF DIGITALIS IN CHILDREN WITH HEART DISEASE

HAROLD E. B. PARDEE

Children who show subjective or objective signs of cardiac failure are almost always helped by digitalis. Children who do not have any evidence of the cardiac function do not derive any benefit from digitalis. There is no contraindication for giving digitalis in the presence of fever nor is the fact that the patient is not sick enough to be in bed a contraindication.

It is not so much the total amount of digitalis given which effects the heart, as the concentration of digitalis in the body at a given moment. At a certain concentration therapeutic effects are obtained, at a greater concentration toxic effects appear. The concentration depends upon a balance between the total dose and the daily output. The administration must take into account three facts:

1. Therapeutic effects are obtained on the average from 2 minims of the tincture per pound of body weight or 2 grains of the leaf for 10 pounds.
2. Different children vary greatly in susceptibility so that toxic symptoms may develop in susceptible children from half this dose.
3. During each 24 hours some of the drug is destroyed or excreted from the body.

It is never proper to give the full therapeutic dose all at once on account of the danger of poisoning susceptible children. For an initial dose 1 minim of tincture per pound of body weight or one grain of the leaf for 10 pounds is quite proper. Twelve hours after this dose, if it is necessary to continue, use 20 minims or 2 grains twice a day, watching for therapeutic or toxic effects. When therapeutic effects appear do not stop the drug but reduce the dose to 10 minims of tincture or one grain of leaf twice daily. This might be called the maintenance dose for it is equal to the daily excretion. When toxic signs appear stop digitalis until they have gone. Then resume with the maintenance dose.

For ambulatory patients start with 20 minims of tincture or two grains of the leaf at 7 A. M., 2 P. M., and 9 P. M., until the

child has received one minim per pound of body weight plus one extra dose for each day of administration. Then continue this dose twice daily until some effect is observed, either toxic or therapeutic. Then proceed as described. The maintenance dose should be continued for several weeks. For children less than 30 or 40 pounds in weight we are in doubt about the maintenance dose. The initial dose of one minim per pound is right, but after that we are uncertain. I believe that 15 minims of the tincture twice daily is proper; except for those less than 15 pounds, who should receive seven minims three times a day.

There is rarely need for intravenous medication in children with heart disease. If it seems advisable, however, for children who have not had any digitalis previously, the proper dose is one minim per pound of body weight of digitan solution; 1.2 minims per pound of digalen and digifolin. For those who have had digitalis previously, we should not give more than one-tenth of this dose, but can repeat this every hour or two until an effect is evident.

ABSTRACTS OF PAPERS DELIVERED BEFORE THE NEW YORK ACADEMY OF MEDICINE AT THE STATED MEETING OF FEBRUARY 18, 1926

DISTURBANCES OF URINATION DUE TO SYSTEMIC DISEASES AND DRUGS

HARRY GOLD

Urinary disturbances occur with considerable frequency in most of the broader classes of systemic disease: in metabolic disorders, endocrine disorders, blood diseases, circulatory disturbances, disturbances of the central nervous system, acute and chronic infections, as evidence of reflex conditions, and in the use of certain drugs.

In this paper a certain number of systemic conditions are described briefly, particularly some of those in which the urinary symptoms, being the outstanding complaint of the patient, might present problems for diagnosis.

Patients with diabetes mellitus may present such marked frequency of urination due to the rapid filling and nervous state of the bladder as to mask the large quantity of urine passed daily. The different types of nephritis present various urinary disturbances. The blood dyscrasias form a large group of diseases in which the essential urinary disorder is hematuria. The urinary disturbances of pernicious anemia due to involvement of the central nervous system are discussed. Functional urinary disturbances in patients with tuberculosis due to tuberculous toxemia and cured by tuberculin administration are described by Kovats in 1923. Steifler and Volk in 1915 and Lion in 1922 describe similar urinary disorders due to prolonged exposure to cold. Retention of urine due to spasm of the sphincter occurs in tetany. Urinary disturbances occur in association with various forms of arthritis, in peliosis rheumatica, oxalic acid gout, recurring polyarthritis described by Boeminghaus. Disturbances of urination are described by Duke as a manifestation of allergy. Examples are cited of frequency, pain, incontinence and retention as the result of a reflex from some focus, as the intestinal tract and ureter.

Drugs do not commonly disturb bladder function though several drugs are known to have a direct action upon the bladder wall and sphincters. The silver preparations introduced into the urethra may produce a chemical cystitis. Various urinary disturbances follow poisoning by phosphorus, arsenic, bichloride of mercury, phenol and the cresols. The salicylates, the barbituric acid series of drugs, and quinin taken over long periods and in excessive amounts may cause hematuria. Strangury and hematuria are produced by urotropin, hemitol, cystopurin and hexamethylenetetramine. Examples are cited of volatile oils producing various urinary disturbances, terpineol, oil of sandal, copaiba, cubeb, juniper, apiol, savin. Chrysarobin and cantharides may cause urinary disorders. A number of observers have reported interesting bladder disturbances in the dye industries, in those working with benzol, toluol and naphthalin. In chronic ergot poisoning the bladder may participate in the general muscle contractures resulting in involuntary urination and tenesmus. Bladder disturbances occur in acute morphin poisoning. Czapek and Wassermann reported cases of acute re-

tention of urine following morphin in therapeutic doses. This condition may be more common than is generally suspected.

THE SIGNIFICANCE OF DISTURBANCES OF THE FUNCTION OF THE BLADDER

ALFRED T. OSGOOD

By permission of the Chairman of the Section, I am taking the liberty of enlarging the scope of the subject assigned to me to include the consideration of the significance of disturbances of the function of the bladder from the standpoint of the urologist. In the brief statement expected, this can be merely fragmentary, indicating some of the chief features only. Before considering the significance of these disturbances, let us consider what the functions of the bladder are and what we mean by disturbance of these functions.

The Bladder.—The bladder is the reservoir for storage of urine—a waste fluid which is discharged from time to time. The bladder comprises:

1. Inlet apparatus.
2. Storage apparatus.
3. Discharge (outlet) apparatus.

The outlet or discharge apparatus consists of two valves surrounding the outlet tube which are in tonic contraction except when incited to dilate through the reflex of micturition. The act of micturition is under volitional control, so that any amount of urine may be expelled at will, or an amount much greater than that rated as normal may be retained at will. That is to say, the volume of fluid may vary within wide limits for the inception of the reflex of micturition. The reflex may be initiated and carried out regardless of the amount of fluid in the reservoir; it may be voluntarily controlled in spite of sharp excitation of the reflex mechanism when distended with a very large amount of fluid, 1500 cc., for instance. A bladder entirely empty or holding but a few drops will react with great frequency and marked expulsive force to the influence of an acute inflammation in the posterior part of the urethra or a jagged foreign

body caught in this part of the urethra. The bladder, isolated from its connections through nerves with the spinal cord and all the nerve plexuses, will automatically collect, retain, and discharge urine in the living animal. The bladder after death retains fluid—*i.e.*, at death the sphincters retain some tonic contraction.

The process of filling and the process of distending the bladder up to capacity take place unconsciously without sensation, while retention beyond normal capacity and the proper performance of the discharge of any amount collected are conscious and controlled acts.

The physiology of the bladder must take into consideration the tonus of the bladder musculature as it reacts to the distention of the cavity with fluid. This tonic contraction may be measurable within rather wide limits as an estimate of the normal, but the contraction of the bladder muscles is only a part of the function of micturition, and action of the sphincters is also a part. To my mind, clinically, the function of the sphincters is the more important, and, so far as pathological conditions are concerned, it is lesions which affect the sensory sphere within these sphincters that induce the contraction of the bladder muscle and raise the tonus of the bladder when the reflex for micturition is initiated by sensory abnormality in the urethra. Most physiological experiments are carried out upon animals from which there is lacking interpretation of the sensory reactions and of voluntary inhibition and control. In the human being, similar experimentation is often impossible, and the sensory reactions are perhaps the most important feature of all experiments. For instance, every experiment in which a catheter or other instrument is passed through the highly sensitive urethra must take into consideration the reaction to this sensation in which voluntary inhibition, voluntary muscular control of the external sphincter, play an important part in the effect upon function of the bladder.

Disturbances of the function of the bladder are indicated to us clinically by the following signs or symptoms:

1. Disturbances of normal sensation (pain?),—sensory abnormality.
2. Disturbance of the normal frequency of evacuation,—abnormal infrequency, abnormally increased frequency.

3. Abnormal retention in the reservoir: (a) partial; (b) complete.
4. Incontinence: (a) partial; (b) intermittent; (c) complete.
5. Incoördination of micturition.

Disturbances of normal sensation are various,—discomfort, accentuated desire for urination, uncontrollable (imperative) demand for urination; pain, referred to the region of the bladder or to its outlet indefinitely behind the symphysis, or in the perineum or urethra. I am inclined to believe that a distinction can be made between a painful sensation referred through the abdominal wall above the symphysis to the bladder itself and the discomfort or pain (also often and commonly interpreted as bladder pain), referred (when accurately described or describable) to the bladder outlet,—a demand for urination, painful efforts at control of the demand for urination, voluntary control or inhibition of the micturition reflex.

The normal bladder *mucosa* possesses a very low grade of sensibility. A stone often lies unperceived in the bladder for many years. Burn the *mucosa* of the bladder itself with the actual cautery, and the patient has little or no response in pain or in disturbance of bladder function. New growth of the *mucosa* goes unperceived, commonly, until bleeding occurs. Let a kidney pour pus from a pyonephrosis into the bladder for years, and often no disturbance of bladder function takes place. Look at the mucous membrane of such a bladder from which you have withdrawn several ounces of pure pus, and it is in many (not a few) cases perfectly normal after storing such material maybe for years. Per contra, burn through the *mucosa* into the *submucous* or *muscular* coat, then pain and abnormally frequent bladder contractions may follow. When a growth extends deeper than the *mucosa*, pain and disturbed function are the rule. An ulceration or inflammation involving the *submucosal* coat is one of the distressingly painful conditions with greatly disturbed function—*interstitial cystitis*. We cannot, however, go so far as to aver that sensory nerve endings are found only in the *submucous* or *muscular* coats.

Cystitis.—Inflammation of the tough mucous membrane of the bladder is due to infection from the inlet or from the outlet.

A diagnosis of cystitis cannot be made by means of a catheter or by any symptoms. A diagnosis can be made only by viewing the mucous membrane. I am almost prepared to maintain (with some qualifications and reservations) that cystitis does not produce pain; that cystitis does not give rise to temperature and chills; that cystitis per se does not disturb bladder function; that cystitis is easily and promptly curable. Cystitis is curable only upon removal (if possible) of the source of infection by which it is maintained.

This is an old story. It is the duty of the urologist to preach it constantly on every available occasion, and to insist that cystitis demands a prompt search for some other lesion which may be of maximum importance. To treat cystitis without finding its cause is, to be sure, sometimes beneficial, even successful, but it is futile in the majority of cases.

Parts not anatomically the bladder itself.—1. Filling apparatus. 2. Discharge apparatus.

The Filling Apparatus.—Disturbances of function of the bladder ascribable to the filling mechanism must include all the disturbances that arise from products of disease of the kidney and ureter.

1. Calculus, ulceration, and stricture in the lowermost portion of the ureter give rise to pain and abnormally frequent urination because the muscular fibres of the lower ureter extend into the trigone toward and into the outlet of the bladder (the urethra), and the sensations of the lower end of the ureter are interpreted only in the trigone and vesical outlet. A pain, then, of the lowermost portion of the ureter is practically a pain felt in the vesical outlet. Furthermore, these lesions which induce sensory abnormality in the lower ureters produce disturbances of the frequency of evacuation, or incontinence, by initiating the reflex of micturition. The ureters (inlet apparatus), when the seat of pathologic lesions, may be the source, then, of disturbances of the functions of the bladder.

The Outlet Apparatus.—These parts, comprising the outlet apparatus, embryologically and anatomically considered, belong to the urethra and to the functions of the urethra.

The Sphincters.—*Internal*—smooth muscle at vesical outlet = tonic contraction,—dilated only through reflex—not directly

volitional. *External*—striated muscle surrounding urethra between layers of the triangular ligament = tonic contraction \pm voluntary contraction,—dilatable through reflex \pm volitional control.

All the disturbances of this discharge mechanism are indicated by the same signs as those mentioned for the bladder,—i.e., all signs (pain, abnormal frequency, retention, and incontinence) of disturbance of the function of the bladder are those of the outlet—the sphincters. Each sphincter may act adequately alone. This is plainly demonstrable in surgery, as well as experimentally. (1) Remove the entire internal sphincter, amputating the bladder neck with the entire prostatic urethra and prostate; suture the bladder and membranous urethra; if the external sphincter is uninjured, perfect retention, normal capacity of bladder, and fully controlled function remain; or cut the sphincter internus and the external sphincter does all the work perfectly. (2) Mutilate or open the membranous urethra about which the external sphincter acts, so that an open sinus persists at this point; if the internal sphincter is normal, perfect retention, normal bladder capacity, large capacity under volitional control, and fully controlled function result. (3) Injure both internal and external sphincters by dividing them, for example, and incontinence results.

Urethral Lesions.—Inflammation, stone, traumatism, new growth (hypertrophy of prostate and cancer) of prostate all produce abnormal sensation,—perhaps pain in that part of the urethra about which the sphincters act, and this gives rise to both involuntary and voluntarily induced abnormal disturbance of frequency of urination.

Retention of urine, partial or complete, may be due to stone obstructing the outlet or to growth or fibrous tissue interfering with the normal function of the internal sphincter producing readily understood mechanical interference, to be mentioned only in passing.

Incontinence of urine indicates a failure of both internal and external sphincters to perform in normal fashion. Impulses not under control bring about evacuation of the bladder. In some cases, in many probably, the sensory nerve endings in the urethra are so injured or submerged in growth or congestion or inflam-

mation that natural recognition of the desire or need for urination is lost, with the result that an automatic reflex may take place from time to time—intermittent incontinence.

Paralysis of both sphincters,—wide open internal sphincter with no tonic contraction and no ability to voluntarily contract the external sphincter,—(resulting in complete continuous incontinence with bladder contracted and urine flowing out through the urethra as it is ejected from the ureters into the bladder),—is seen with nervous disease, such as *tabes dorsalis* and in serious injury of both sphincters. All varieties of incoördination take place with such a disease as *tabes dorsalis*. Here we may have any one or any combination of injuries (stimulation or destruction) of centres in the cord. Sometimes individual parts only are affected, such as paralysis of the internal sphincter with intact external sphincter and detrusor; at times, paralysis of the external sphincter's voluntary control only; sometimes loss of sensation seems to be the chief result. Practically normal sphincters with paralysis of the detrusor is, I believe, demonstrable in some cases of locomotor ataxia.

The clinician, then, considers the significance of dysfunction of the bladder as a disturbance not so much of the bladder itself, as a disturbance of its outlet and of the mechanism which maintains the normal holding capacity and the discharge of its content through the coördinated opening of its valves. The major disturbances of the function of the bladder are due to disease or abnormality in or connected with this outlet mechanism. The symptoms, pain, frequency, retention, and incontinence are significant of disturbance of the outlet mechanism. The great majority (in numbers of cases, at least) of disturbances of the function of urination are due to lesions located in the urethra, where these valves lie.

Disease of the bladder itself is usually promptly determined by examination with a cystoscope. The significance of disturbances of the function of the bladder must always be sought first, in or from the urethra—male or *female*; second, in or from the ureters; and, third, in the bladder itself.

I present these facts in this way because text-books on anatomy, physiology, and urology,—from which most of us have gained our knowledge of bladder function and their disturbances,

—fail to bring about a proper appreciation of the fact that the urethral sphincters are the chief features of the bladder, and this leads to a failure on the part of the profession generally, and a failure on the part of trained urologists even, to fit the signs and symptoms to the facts, resulting in serious loss to the individual patient in a large number of cases of disturbance of the function of the bladder.

BLADDER DISTURBANCES IN BRAIN AND SPINAL CORD TUMORS

CHARLES A. ELSBERG

The subject is of importance to the genito-urinary specialist because bladder disturbances may occur as early symptoms of new growths of the brain and spinal cord. Patients have been treated for considerable periods for supposed vesical disease and cystitis, who had compression of the spinal cord from tumors or enlarged blood vessels or in whom the symptoms were due to a neuritis of the roots of the cauda equina. Patients with bladder symptoms apparently due to an enlarged prostate were seen in whom the bladder symptoms were due to the spinal cord lesion rather than to the enlarged prostate.

In patients with new growths of the brain and spinal cord (excepting those which involve the sacral cord and the roots of the cauda equina), the bladder disturbance is either an increased irritability or a retention of urine with perhaps secondary incontinence.

Of 165 patients with tumors of the brain, 69, or 41%, had mental disturbances, and 60, or 36%, had some disturbance in emptying of the bladder; 23% had occasional or continued incontinence. The patients with frontal lobe tumors, in whom mental disturbances were frequent, often had urinary disturbances; thus three-quarters of the patients with frontal lobe tumors had some disturbance of the bladder function, and almost one-half had occasional or continued incontinence; only one-tenth of the patients with posterior fossa tumors, one-seventh of those with parietal lobe tumors, and one-fifth of those with temporal lobe tumors had incontinence. On account of the greater frequency

of mental disturbances in tumors of the left frontal lobe, incontinence occurred more often in left frontal tumors than when the growth was on the right side.

If the patients in stupor or coma were excluded, urinary disturbance occurred about so often in cortical as in subcortical growths.

In tumors of the spinal cord, bladder disturbances occurred much more frequently in extramedullary, extradural and conus and cauda tumors than in intramedullary growths. There is no particular section of the cord that is especially concerned with control of the vesical sphincter, but the lower down in the spinal cord the tumor, the greater the frequency of bladder disturbances.

Bladder disturbances usually appear late in spinal cord tumors excepting in extradural malignant disease.

In patients with intramedullary tumors, interference with bladder function, although more rare, appears earlier in the course of the disease.

Regarding bladder disturbances in spinal cord tumors, the following may be said: If the spinal symptoms have lasted less than six months, difficulty in emptying the bladder is most frequent; if they have lasted from six to twelve months, difficulty in urination or incontinence are frequent; and when the symptoms and signs of spinal compression have lasted several years or more, incontinence either due to overflow or true paralysis of the sphincter muscles is most frequently observed. It seems to be the rule that there always is a marked disturbance of sensation and motor power before distinct bladder disturbances occur.

ABSTRACTS OF PAPERS PRESENTED BEFORE
THE SECTION OF OTOTOLOGY,
FEBRUARY 12TH, 1926

PAPILLEDEMA FROM THE VIEWPOINT OF THE
OTOLOGIST

EDWARD B. DENCH

The speaker made attempt to discuss the finer physical differentiations between simple edema of the disc and edema combined with inflammatory changes of the optic nerve and retina. He emphasized the fact that simple papilledema of the optic disc was mechanical in origin and that it might be present in any of the intracranial complications of middle ear suppuration. The condition occurs less frequently in extradural abscess than in any of the other intracranial complications, and is probably most common in diffuse meningitis than in any of the other complications. Simple papilledema is due to increased intracranial pressure,—an optic neuritis or a neuroretinitis to an inflammatory process in the structures involved. By some this is thought to be a direct extension of the inflammatory process within the cranium. Attention should also be drawn to the importance of papilledema as a sign of intracranial neoplasms. Such cases presenting aural symptoms not infrequently come to the otologist in the early stages of their affliction.

In closing, the importance of fundus changes in lues, diabetes, and nephritis were pointed out. Aural symptoms may be a prominent feature in all of these conditions and these cases are often first seen by the otologist. The writer also spoke of the advisability of each otologist becoming familiar with the use of the ophthalmoscope.

THE SIGNIFICANCE OF PAPILLEDEMA IN
NEUROSURGERY

WILLIAM SHARPE

In the diagnosis and surgical treatment intracranial lesions, a competent ophthalmoscopic examination is possibly the most important single test in a neurological examination; without a

careful fundal investigation, no neurological examination is complete. Normal fundi, naturally, do not exclude intracranial surgical lesions.

The term papilledema of the degree of "choked discs" presupposes the earlier milder stages of papilledema of the degree of edematous blurring of the nasal halves and temporal margins indicative of a mild increase of the intracranial pressure and these findings can be confirmed or disproven by the accurate measurement of the pressure of the cerebrospinal fluid at lumbar puncture with the spinal mercurial manometer. Experimentally, the various stages of papilledema can be carefully studied by producing an internal hydrocephalus in dogs. No edema of the optic discs in the absence of sinus disease and local infective processes and in patients who are not myopic, should be considered within normal physiological limits without an accurate registration of the pressure of the cerebrospinal fluid using the spinal mercurial manometer.

The ophthalmoscopic findings in the following conditions were briefly discussed: Tumor, abscess, traumatic hemorrhage and cerebral edema, and in the internal and external types of hydrocephalus.

The following conclusions were expressed: careful ophthalmoscopic examinations are of the greatest importance in the differentiation of many intracranial surgical lesions; the signs of moderate intracranial pressure should be recognized and it should be realized that "choked discs" occur only as the result of high intracranial pressure; the spinal mercurial manometer is the most accurate means of determining the intradural pressure.

PAPILLEDEMA IN RELATION TO OPHTHALMOLOGY

CONRAD BERENS

Doctor Berens said that early diagnosis of papilledema is important and in the incipient stages it may be difficult to differentiate from papillitis and pseudopapillitis. Papilledema should make one strongly suspect the presence of brain tumor, but it should be considered as a late rather than an early diagnostic sign.

Greater swelling of the disc was usually seen in the eye with the lower tension but exceptions frequently occur. No important diagnostic conclusion could be made from the degree of swelling of the disc as to the probable location of a cerebral lesion, its extent or the length of time it had existed.

He believes that the mechanical theory of Manz and Schmidt-Rimpler combined with a toxic factor seemed to offer the most logical explanation of the production of papilledema.

Early operation may be indicated in patients who have small optic canals as shown by roentgenograms.

In treating papilledema neither the etiology nor the question of which theory in regard to the mechanism is correct, is as important to the ophthalmologist as the question of saving useful vision. Therefore, if loss of vision is feared in papilledema and simple methods of treatment have failed, decompression should be performed if the pressure of the cerebrospinal fluid is raised. The procedure is practically without danger and may save useful vision.

In papilledema of undetermined etiology, it may be justifiable to inject vaccines or some other protein for the non-specific effect in raising cell resistance, in addition to using arsenic, mercury and iodine, and performing spinal puncture.

Surgical intervention in regard to the question of saving useful vision is more frequently resorted to, too late, rather than too early, in the treatment of papilledema.

In Baillart's new pressure gauge we have a way of determining the presence of increased intracranial pressure at an early stage. If these findings are confirmed by the spinal mercurial manometer, when spinal puncture is not considered too dangerous, early treatment of the causes of papilledema may be possible, for it is his opinion that choked disc is usually a symptom of high intracranial pressure.

ABSTRACT OF PAPER DELIVERED BEFORE
THE SECTION OF OBSTETRICS AND GYNE-
COLOGY, FEBRUARY 23, 1926

THE SEDIMENTATION TEST—AN AID IN OBSTETRICS
AND GYNECOLOGY

HERMAN L. FROSCH

The phenomenon of the varying rates of sedimentation of red blood cell in different diseases has been observed as far back as 1767. But it is only within the last five years that the medical profession has awakened to the diagnostic and prognostic aid that it may give. A simple method is described of doing this test.

A sedimentation rate of more than two hours is considered normal. A sedimentation rate of one hour or less indicates an acute infectious condition, medical, surgical or gynecological exists. An increasing sedimentation time means that the patient is improving; a diminishing sedimentation time is an indication that the patient is getting worse. This test is particularly important in tuberculosis.

A surgical patient having a sedimentation time of less than one-half requires an immediate operation. Very frequently the temperature and blood count are normal yet the sedimentation time indicates an acute infection, which on operation shows that the test was correct in its diagnosis of an acute condition.

The test is of no help in the diagnosis of pregnancy, but is of aid in the differential diagnosis from fibromyoma uteri, the sedimentation time being less in the former. But should the latter undergo degeneration, then it cannot be used to differentiate the two as the sedimentation time is about the same. Non-bleeding extra uterine pregnancies have the same sedimentation time as normal pregnancies. It is only when an ectopic ruptures, that the sedimentation time becomes rapid. Neither is it of aid in diagnosing eclamptic or pre-eclamptic conditions. During the post-partem period, the sedimentation time is less than one hour, so that if a toxemia or septicemia develops the test is of no aid.

The test is of most use to the gynecologist in adnexal disease both as to the time of operation and differential diagnosis. If

there is a question of differential diagnosis between ectopic pregnancy, ovarian cyst or any other tumor and pyosalpinx, then a sedimentation time of less than one-half hour rules out the former conditions. In a salpingitis, if we believe that no case should be operated on during the acute stage, then any sedimentation time in such a patient of less than one hour should mean watchful waiting. The more rapid the sedimentation time the more acute the infection. Especially should this test be used in cases of adnexal diseases having a normal temperature and normal blood count.

In malignancy the sedimentation time is rapid. Removal of the tumor brings the sedimentation time to normal. A recurrence of rapid sedimentation time indicates that the malignancy has recurred provided all other sources of acute inflammation have been eliminated.

Experiments have proven that the increased rate of sedimentation in the conditions mentioned is dependent on a relative increased globulin and fibrogen content of the serum.

Cases are cited to prove the statements made concerning the test.

CONCLUSIONS

1. Sedimentation time of more than two hours is considered normal.

2. An increasing sedimentation time means that your patient is improving. A diminishing sedimentation time means that your patient is getting worse.

3. The diagnosis is poor in any case having a persistent sedimentation time of less than one-half hour.

4. Any surgical case having a sedimentation of less than one-half hour requires an immediate operation.

5. This test is of no aid in the diagnosis of pregnancy.

6. In gynecological pelvic conditions it is an aid both in the differential diagnosis and also as to the time for operation.

ABSTRACTS OF PAPERS DELIVERED BEFORE THE SECTION OF HISTORICAL AND CUL- TURAL MEDICINE, JANUARY 28TH AND FEBRUARY 25TH, 1926

EVOLUTION OF THE SUBJECT OF APPENDICITIS

ROBERT T. MORRIS

The subject of appendicitis belongs to the latter part of the 19th century and to the 20th century up to date. It has, however, covered three of the four eras in surgery in this short period of time. In the first, or Heroic Era, it is not unlikely that some of the abscesses belonging to appendicitis were opened by surgeons who knew nothing of the origin of the infection. In the second, or Anatomical Era, the appendix vermiformis was occasionally subjected to surgical procedures in operations belonging to what was called "typhlitis." The great advances in this particular phase of surgery were made almost explosively along the development of the third, or Pathological Era, of surgery. The leading idea during this era included the removal of all infected structures and all by-products of infection by means of the surgeon's art. This, however, meant a great deal of meddlesome surgery conscientiously performed, but harmful on the whole. In the fourth, or Physiological Era of surgery, the dependence is placed largely on the patient's ability to control infection. He is subjected to the least degree of surgery, which will suffice for turning the tide of battle in a case of acute appendicitis, and attention is given to conserving his protective resources. In addition to acute appendicitis, five separate and distinct kinds of chronic appendicitis have been recognized and classified.

INTIMATIONS OF PUBLIC HEALTH IN EARLY NEW YORK

DONALD B. ARMSTRONG,

Assistant Secretary, Metropolitan Life Insurance Co.

The records of early New York during both the Dutch and English occupation up through the first half of the nineteenth

century reflect the sanitary and hygienic problems of which the community and its leaders were conscious. One finds certain measures of personal hygiene and certain initial provisions for the control of medical service, including certain beginnings at the socialization of medicine. There is an early recognition of the need for sanitary regulation, for city planning, and for organized efforts to meet collectively, such requirements as prove to be beyond the range of individual capacity. The records are fragmentary, yet symbolic and indicative of the trend of the times—the pre-natal period of the sanitary awakening to follow.

Examples are cited, including the earliest official effort to regulate the practice of medicine, legislation for the control of midwifery, rules and regulations regarding the inspection of meat, water supply, street cleaning, drains, hogs, rubbish, filth, ashes, dead animals, ill-smelling cheese, etc.

Of some special interest, though perhaps to a degree aside from the main question, are early records on the problem of liquor control, including apparently a Dutch experiment with what we now know as the Canadian Quebec System. The results of early restrictive liquor legislation are apparently not inconsistent with Volsteadian experience.

The earliest fairly reliable mortality statistical records for New York City are found in a semi-centennial table of mortality covering the period 1804-53. There are here many curious reflections not only of the death certification procedure of the times but of the prevailing sanitary conditions of the city. Odd causes of death are noted, such as salivation, drinking cold water, mis-menstruation, etc. The records reflect the terrible conditions that prevailed in New York City at the beginning of the nineteenth century, with yellow fever and cholera annual death rates per 100,000 of 344 and 1,557, respectively.

The situation was little improved until the work of Dr. Stephen Smith, his sanitary survey, and the establishment through his efforts of the Metropolitan Health Board.

The history of public health in New York City reflects the transition from the environmental to the personal, from sanitary policing to individual persuasion, from suppressive legislation to individual responsibility. In medicine, veering away from the early communism of the Dutch Colony, there has been noted a

successive period of expansion of the private practice of medicine with a gradual return to a greater degree of group medical control for large sections of the population. This has been followed by specialization on the one hand, and on the other, through the hygienic educational responsibilities of the profession, through the practice of periodic examinations, by the opening up of a much larger and greater field for the general practitioner—the private practice of preventive medicine. Public health work, especially in its more recent educational aspects, has more than kept pace with the growth of the city. In spite of our tremendous expansion in numbers, and complexity of organization, life in New York to-day is safer, happier, and longer than it was in the Manhattan of long ago.

PROCEEDINGS OF ACADEMY MEETINGS, 1926

STATED MEETINGS

January

ANNUAL MEETING

Thursday Evening, January 7th, at 8:30 o'clock.

ORDER

1. Reading of the Minutes.
2. Annual report of the President.
3. Reports of Council and Trustees.
4. Reports of Officers.
5. Reports of Committees.
6. Action on Constitution and By-laws.
7. Other Business.
 - a. Nominations for Trustee.
 - b. Appointment of Nominating Committee for 1926.
8. Addresses.
 - a. Early days in the Academy, D. Bryson Delavan.
 - b. Academy activities in our present building, Samuel W. Lambert.
 - c. The future work of the Academy, Linsly R. Williams.

The proceedings of this meeting have been published in the February and March numbers of the BULLETIN.

STATED MEETING

Thursday Evening, January 21st, at 8:30 o'clock.

Program presented in coöperation with the Section of Medicine and the Section of Dermatology and Syphilis.

ORDER

- I. Executive Session.
 - II. Papers of the evening.
 - a. Some considerations of the mode of infection and extension of erysipelas, John C. Doane, Philadelphia (by invitation).
 - b. Experimental basis of specific treatment of erysipelas, Harold L. Amoss, Baltimore (by invitation).
 - c. Pruritus, causes, effects and treatment, Sigmund Politzer.
 - d. Drug eruptions, George M. MacKee.
- Discussion—
- Chas. James White, Boston (by invitation).
 John Stokes, Philadelphia (by invitation).
 I. L. McGlasson, San Antonio (by invitation).
 Howard Fox.
 Hermann Goldenberg.
 Walter J. Highman.
 Charles M. Williams.

SECTION MEETINGS

January

SECTION OF DERMATOLOGY AND SYPHILIS

Tuesday Evening, January 5th, at 8:15 o'clock.

ORDER

- I. Presentation of patients.
 - a. Cases presented from the Vanderbilt Clinic.
 - b. Cases from the Skin and Cancer Hospital, Charles Malory Williams.

- c. Cases from Fordham Hospital, Benjamin F. Ochs.
- d. Miscellaneous cases.

II. Discussion.

III. Executive Session.

SECTION OF SURGERY

Friday Evening, January 8th, at 8:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Presentation of Cases.
 - a. Three cases of undescended testicle, Carl Eggers.
 - b. Cases of undescended testicle, Franz Torek.
 - c. 1. Complete branchial fistula and cyst—excision.
 - 2. Diffuse fibroma of eye-lids and cheek—plastic operation.
 - 3. Cases demonstrating paper of the evening, Herbert Willy Meyer.
- III. Papers of the evening.
 - a. The prevention of toxemia in superficial burns, Edward C. Davidson (by invitation).
 - b. Undescended testicle—with special reference to Torek's method of orcheopexy, Herbert Willy Meyer.
- IV. General Discussion.
- V. Demonstration of Instruments.

New automatic electro-mechanical apparatus for transfusion of whole unmodified blood, A. L. Soresi.

SECTION OF OTOTOLOGY

Friday Evening, January 8th, at 2:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Demonstration of New Instruments.

Demonstration of a new instrument for the treatment of OMCC, with superheated air, John Guttman.
- III. Presentation of Cases.
 - a. Presentation of patients showing post-operative results following simple and double modified radical operations for chronic mastoiditis, Hugh B. Blackwell.

b. 1. Case of jugular bulb suppuration following mastoiditis and sinus-thrombosis; operation; recovery.

2. Case of chronic middle ear and labyrinth suppuration; radical mastoid and labyrinth operation; recovery, John McCoy.

IV. Paper of the Evening.

Zinc ionization treatment for chronic discharging ears and allied conditions, John McCoy.

V. General Discussion.

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, January 12th, at 8:30 o'clock.

From the neuro-surgical services of the New York Neurological Institute and the Mount Sinai Hospital and the Laboratory for Experimental Neurology, Columbia University.

ORDER

I. Case Presentations.

a. Cases illustrating differential section of the trigeminal root, Byron Stookey.

b. A case of tumor of the Casserian ganglion, E. D. Friedman.

c. A case of subdural exudate after cranial trauma, Ira Cohen.

d. Chondroma projecting into the spinal canal, A. S. Taylor.

II. General Discussion.

III. Papers of the Evening.

a. An air manometer for spinal manometric tests, C. B. Masson (by invitation).

b. A method for the study of changes of the size and shape of the ventricles in brain tumors, S. Silbert (by invitation).

c. Staining of tumors of the nervous system with silver, Wilder G. Penfield.

d. Intracranial pressure and the susceptibility of animals to convulsive seizures, F. H. Pike (by invitation) and C. A. Elsberg.

IV. General Discussion.

SECTION OF PEDIATRICS

Thursday Evening, January 14th, at 8:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Papers of the Evening.
 - a. The prophylactic value of older plasma and whole blood of convalescents, in measles, Sidney V. Haas, Julius Blum (by invitation).
Discussion by Wm. H. Park, Chas. Herrman, A. Zingher.
 - b. A physiologic study of chronic fatigue in school children, with special reference to the recognition and management, M. Seham, Minneapolis (by invitation).
Discussion by Frederick S. Lee, Ph.D., Charles Hendee Smith.
- III. General Discussion.

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, January 15th, at 8:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Presentation of Cases, Case Reports, and New Instruments.
From the staff of the Hospital for Ruptured and Crippled.
 - a. 1. Case of sacro-iliac arthritis.
2. Late results in an operation for paralytic valgus, Percy W. Roberts.
 - b. Bilateral congenital dislocation of patellae—2 cases in 1 family, Brainard H. Whitbeck.
 - c. 1. Osteochondritis of elbow.
2. Subluxation of 4th lumbar vertebra, Samuel Kleinberg.
 - d. Loose bodies in knee, with involvement of patella—2 cases, William L. Sneed.
 - e. Reinforcement of acetabulum for paralytic and congenital dislocations of the hip—3 cases, Armitage Whitman.
 - f. Cases demonstrating unusual vertebral injuries, Irvin S. Balensweig (by invitation).
 - g. Adolescent kyphosis due to vertebral epiphysitis, Joseph Buchman (by invitation).

h. Dislocation of scaphoid, wrist; marked ulnar deviation of hand; excision of scaphoid, Lewis Clark Wagner (by invitation).

i. 1. Extensive hemangioma of knee joint—operation.

2. Reconstruction anterior crucial ligament of knee joint—3 cases (lantern slides), Arthur Krida.

III. Papers of the Evening.

The non-operative treatment of bursitis, Charlton Wallace.
Significance of the accessory tarsal scaphoid (lantern slides), Isadore Zadek.

IV. Discussion.

SECTION OF OPHTHALMOLOGY

Monday Evening, January 18th, at 8:30 o'clock.

ORDER

I. Reading of the Minutes.

II. Presentation of Cases.

a. Left exophthalmos (receded) followed by right pulsating exophthalmos, John M. Wheeler.

b. 1. Two cases of skull injury with unusual eye complications.

2. Two cases of embolus of central artery with unusual eye complications, Martin Cohen.

c. A case of sympathetic ophthalmia cured by exenteration of the nasal accessory sinuses, Ben Witt Key.

d. Brain tumor with papilledema in the right and complete atrophy of the nerve in the left eye associated with a right homonymous hemianopsia, J. F. Neuberger U. S. N. (by invitation).

e. Flat melano-sarcoma of the choroid with orbital involvement. Exenteration. Photos of sections. X-ray plates, James W. Smith.

III. Paper of the Evening.

Detection of malingerers, Ervin Torok (by invitation).

Discussed by Conrad Berens and J. A. Acheson (by invitation).

IV. General Discussion.

SECTION OF GENITO-URINARY SURGERY

Wednesday Evening, January 20th, at 8:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Case Reports.
 - a. Torsion of the testicle with presentation of patient and specimen, Maurice Meltzer (by invitation).
 - b. A case of Schistosoma Haematobium, Archie L. Dean, Jr.
- III. Presentation of New Instruments.
 - a. Dilatation of the ureter with rubber bags in the treatment of ureteral calculi. Presentation of modified operating cystoscope—a preliminary report, Ralph Dourmashkin.
 - b. Minor surgery of the prostate gland. A new cystoscopic instrument employing a cutting current capable of operation in a water medium, Maximilian Stern.
- IV. Paper of the Evening.

The recognition of uric acid stones in the kidney and uric acid showers, Edwin Beer.
- V. Discussion—to be opened by Edward L. Keyes and Joseph F. McCarthy.
- VI. Executive Session.

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, January 26th, at 8:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Case Report.

Case of anencephalus with adherent amnion causing malposition with premature separation of the placenta (specimen presented), A. Flaischer (by invitation).
- III. The results of diathermy in pelvic infections, Th. H. Cherry.

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, January 27, at 8:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Presentation of Cases.

A case of chronic antritis, necrosis of the superior maxilla, operation, oral fistula, Irving W. Voorhees.

III. Papers of the Evening.

- a. A further study and clinical report of the use of acriviolet in the diseases of the upper respiratory tract, Arthur J. Herzig.

Discussion by

John W. Churchman (by invitation).

John E. Mackenty.

Joseph H. Abraham.

- b. Intubation of the oesophagus for carcinomatous stricture (lantern slides), Merwin C. Myerson (by invitation).

IV. General Discussion.

V. Executive Session.

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Thursday Evening, January 28th, at 8:30 o'clock.

ORDER

I. Reading of the Minutes.

II. Papers of the Evening.

- a. Evolution of the subject of appendicitis, Robert T. Morris.
- b. The anatomic art of Leonardo da Vinci (lantern illustrations), Prof. Herbert R. Cross (by invitation), L. Pierce Clark.

III. General Discussion.

Books, pamphlets, and pictures relating to both subjects will be on exhibition, arranged by the Academy Librarian.

STATED MEETINGS

February

STATED MEETING

Thursday Evening, February 4th, at 8:30 o'clock. Program presented in cooperation with the Section of Pediatrics.

ORDER

I. Executive Session.

Election of Trustee.

Final action on proposed changes in the Constitution and By-laws.

II. Papers of the Evening.

- a. The significance of the leucocyte count as an index of the rheumatic infection in children, May G. Wilson, M. Kopel (by invitation).

Discussion.

Homer F. Swift.

Theodore B. Barringer, Jr.

- b. Certain observations on the course of rheumatic heart disease, John Wyckoff.

Discussion—William C. Munley, Mitchel Field (by invitation).

- c. The use of digitalis in the treatment of children with heart disease, Harold E. B. Pardee.

Discussion—William P. St. Lawrence.

III. General Discussion.

Abstracts of the papers presented at this meeting are published in this number.

STATED MEETING

Thursday Evening, February 18th, at 8:30 o'clock. Program presented in cooperation with the Section of Genito-Urinary Surgery.

ORDER

I. Executive Session.

II. Papers of the Evening.

The significance of disturbances of functions of the bladder.

- a. The nervous control of the bladder and the mechanism of bladder activity, Horatio B. Williams.
- b. Disturbances of urination due to vesical pathology, Alfred T. Osgood.
- c. Disturbances of urination due to drugs and to systemic diseases, Harry Gold (by invitation).
- d. Disturbances of bladder control in brain and spinal cord disease, Charles A. Elsberg.
- e. Bladder disturbances in hysteria and the neuroses, Foster Kennedy.

III. Discussion opened by

Herman O. Mosenthal.

Edward L. Keyes.

Byron Stookey.

Charles A. McKendree.

Abstracts of the papers of Drs. Osgood, Gold and Elsberg are published in this number.

SECTION MEETINGS

February

SECTION OF DERMATOLOGY AND SYPHILIS

Tuesday Evening, February 2nd, at 8:15 o'clock.

I. Presentation of Patients.

a. From the University and Bellevue Hospital Clinic.

1. Acne agninata.
2. Mycosis fungoides (tumor stage).
3. Granuloma annulare.
4. Nodular leprosy (two cases).
5. Maculo-anaesthetic leprosy (two cases).
6. Kaposi's sarcoma.
7. Lupus erythematosus of the mouth.
8. Annular macular syphilide.
9. Syphilitic alopecia.
10. For diagnosis (two cases).
11. Tuberculosis cutis

Howard Fox.

Edward R. Maloney.

Paul E. Bechet.

b. From the New York Skin and Cancer Hospital. Miscellaneous cases, Paul E. Bechet.

c. From the City Hospital.

1. Pemphigus (2 cases).
2. Dermatitis herpetiformis.
3. Scrofuloderma.
4. Erythema indurata (2 cases).
5. Erythema nodosum.
6. Salvarsan dermatitis.

A. Benson Cannon.

d. Miscellaneous cases.

II. Discussion.

III. Executive Session.

SECTION OF SURGERY

Friday Evening, February 5th, at 8:30 o'clock.

ORDER

I. Reading of the Minutes.

II. Presentation of Cases.

- a. 1. Duodenal ulcer, cholecystitis and pancreatitis
2. Intussusception in an adult.
3. Torsion of the omentum without pathology simulating acute appendicitis.
4. Extra peritoneal rupture of the bladder.
5. Myositis ossificans.

J. William Hinton.

- b. Purpura hemorrhagica;—splenectomy, Robert E. Brennan.

- c. Cases of primary carcinoma of the lung, showing tumor cells in the sputum, Julius Gottesman.

III. Papers of the Evening.

- a. Splenectomy for purpura hemorrhagica, Edwin Beer.
- b. Primary carcinoma of the lung, Henry W. Cave.

SECTION OF NEUROLOGY AND PSYCHIATRY

Tuesday Evening, February 9th, at 8:30 o'clock.

ORDER

I. Case Presentations.

- a. A case of cerebral spongioblastoma showing unusual clinical signs (with lantern slides), Joshua H. Leiner (by invitation), Walter M. Kraus.
- b. A case of chronic internal hydrocephalus with a presentation of pathological material, S. Katz (by invitation).

II. Paper of the Evening.

The early x-ray diagnosis of brain tumor, Harry A. Goalwin (by invitation).

Discussion by Charles A. Elsberg, Leon T. Le Wald and Wilder G. Penfield.

SECTION OF OTOTOLOGY

Friday Evening, February 12th, at 8:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Papers of the Evening.

SYMPOSIUM ON PAPILLEDEMA

- a. Papilledema from the viewpoint of the otologist, Edward B. Dench.
- b. Papilledema from the viewpoint of the ophthalmologist, Conrad Berens.
- c. Papilledema from the viewpoint of the rhinologist, E. Ross Faulkner.
- d. Papilledema from the viewpoint of the neurological surgeon, William Sharpe.
- III. Discussion—Arthur B. Duel, J. Ramsay Hunt.
- IV. Executive Session.

Abstracts of the papers of Drs. Dench, Berens and Sharpe are published in this number.

SECTION OF OPHTHALMOLOGY

Monday Evening, February 15th, at 8:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Papers of the Evening.
 - a. Radium therapy in diseases of the eye and adnexa, G. Allen Robinson (by invitation).
 - Discussion—John M. Wheeler, Lewis W. Crigler.
 - b. Intranasal treatment of some definite pathological conditions of the eye, J. Montgomery West, Berlin, Germany (by invitation).
 - Discussion—
 - John E. Mackenty.
 - Stuart L. Craig.
 - Hugh B. Blackwell.
 - Arnold Knapp.
 - Colman W. Cutler.

SECTION OF MEDICINE

Tuesday Evening, February 16th, at 8:30 o'clock.

ORDER

Program presented by the Medical Department of the University of Pennsylvania.

I. Papers of the Evening.

- a. Physico-chemical factors in the formation of gall stones, J. E. Sweet, R. C. Weimer (by invitation).
- b. Some observations on the pathogenesis of coccidioidal granuloma, F. E. Ahlfeldt (by invitation).
- c. Seasonal (pollen) hay fever with negative skin tests; result of treatment, R. A. Kern (by invitation).
- d. Aberrant manifestations of clinical heart block, C. C. Wolferth (by invitation).
- e. Ephedrin: its use in the treatment of vascular hypotension and bronchial asthma, T. Grier Miller (by invitation).

SECTION OF ORTHOPEDIC SURGERY

Friday Evening, February 19th, at 8:30 o'clock.

ORDER

- I. Reading of the Minutes.
- II. Presentation of Cases, Case Reports, and New Instruments.
From the Staff of Mt. Sinai Hospital.
 - a. 1. Subluxation of the patella as a late result of a biceps transplantation.
 2. Transposition of the insertion of the achilles tendon and plantar fascia, (Lorenz Operation) to improve lateral balance of foot in paralytic deformities. Three cases, Seth Selig (by invitation).
 - b. 1. Demonstration of a practical plaster of paris bandage roller.
 2. Cases showing the results of implantation of extensor tendons for claw foot, Edgar D. Oppenheimer.
 - c. Popliteal (Brackett) operation for loose body in knee, Sigmund Epstein.

III. Paper of the Evening.

The place of the orthopedic surgeon in the treatment of the chronic patient, Joel E. Goldthwait, Boston (by invitation):

IV. Discussion.

SECTION OF OBSTETRICS AND GYNECOLOGY

Tuesday Evening, February 23rd, at 8:30 o'clock.

ORDER

I. Reading of the Minutes.

II. Case Reports.

- a. Interstitial tubal pregnancy, Salvatore di Palma.
- b. Spontaneous rupture of the uterus at onset of labor with unusual complications, Herman Lorber (by invitation).

III. Paper of the Evening.

The sedimentation test,—an aid in obstetrics and gynecology, Herman L. Frosch (by invitation).

An abstract of the paper of the Evening is published in this number.

SECTION OF LARYNGOLOGY AND RHINOLOGY

Wednesday Evening, February 24th, at 8:30 o'clock.

I. Reading of the Minutes.

II. Presentation of Cases.

III. Papers of the Evening.

- a. The application of bacterial vaccines locally in the treatment of nasal sinus conditions, Harold Hays.

Discussion by Thos. S. Winslow (by invitation), Arthur Palmer.

- b. Lantern slide demonstration of the anatomy of the accessory sinuses of the nose, Simon L. Ruskin (by invitation).

IV. General Discussion.

V. Executive Session.

SECTION OF HISTORICAL AND CULTURAL MEDICINE

Thursday Evening, February 25th, at 8:30 o'clock.

ORDER

I. Reading of the Minutes.

II. Papers of the Evening.

- a. Studies of mediaeval anatomy, lantern illustrations, A. Elwyn (by invitation).
- b. The development of public interest in public health, lantern illustrations, Donald B. Armstrong.

III. Discussison.

An abstract of Dr. Armstrong's paper is published in this number.

BOOK REVIEW

The Evolution of Anatomy: A Short History of Anatomical and Physiological Discovery to Harvey. By CHARLES SINGER, M.D. XII, 209, pp. 20 pl., 117 illustra. 8° London, Kegan Paul; New York, Knopf, 1925.

The book is the substance of the Fitzpatrick Lectures delivered by Dr. Singer at the Royal College of Physicians (London) during 1923-4. It is dedicated to the memory of the late Professor Arthur Platt, who held the chair of Greek in the University of London during 1894-1925, to whom Singer acknowledges a deep indebtedness for "inestimable help in acquiring such knowledge of ancient medicine as I may possess." With the aid of such an inspiring mentor and with further assistance from Sir George Thane, Professor Elliot Smith and others, our author has produced a work which bids fair to be the best history of anatomy in English for many a long day. He has examined all the basic references first hand, and has been at pains to assemble the most effective and informing illustrations. Perhaps the only source-book which has escaped his attention is the vest-pocket *Historia anatomiae* of Caspar Bauhin (1597), a tiny treasure-trove which gives marginal bibliographic references to all the discoveries made up to the beginning of the 17th century, such as Sprengel gives later in his footnotes. Singer gives, at any rate, for the first time, what we want to know and what we have a right to expect in a book of this kind, viz., definite authenticated statements as to the actual discoverers of the different structures in the human body, with other new information of great value, carried forward in a flowing, easily readable narrative, which orients us, at the same time, as to the meagre advances made in physiology between

the Greeks and Harvey. A fair example of the arresting quality of the author's style is to be found in the opening paragraphs about the immanent anatomical sense or instinct developed in the primitive huntsman, butcher or artist (whether palæolithic or Florentine), and even existing, to some extent, in certain predatory animals. It was only with the Greeks, and later with Leonardo and Vesalius, that anatomy came to be divorced from utilitarian motives (even those of artistic representation), and pursued as an independent science, "for the satisfaction of human curiosity." If the opening chapters (I. II.) are a little dry and didactic, therefore, it is due to the fact that the material (that of classical antiquity) is not, in itself, inspiring, and has been revamped and threshed over by countless hands, to the point of stereotypy. The concluding chapters (III. IV.) deal with the Renaissance, and here Singer rises to the height of his great argument and carries the reader along with him in a spirited *allegro* movement. The tediums of Alexandrian and Galenic anatomy are set off by effective illustrations showing localization of the heart (usually by arrow points) in palæolithic drawings of bison, a wonderful clay model of the human forearms from Cnossus, Crete (1500 B. C.), supplied by Sir Arthur Evans, a Babylonian liver in baked clay, Aristotle's diagram of the mammalian genito-urinary system (restored), an Athenian bas-relief (440 B. C.) giving the human measure of the fathom and the foot (Ashmolean Museum, Oxford), Roman ex voto models of the thoracic and abdominal viscera, and Galen's schemata for the innervation of the larynx and the relation of the blood channels to the three pneumas. A zodiacal figure on a wooden sarcophagus, of Hellenized Egyptian provenance, from the British Museum (1st century A. D.), marks the transition to the stationary anatomy of the Middle Ages. Here Singer is on his own ground, his favorite terrain, and it may be said that he has omitted no single fact or date of consequence and has made accessible to the student a large amount of valuable information concerning the origins of anatomical terms, and other details. He shows clearly the important part played by the great schools of Bologna and Padua in the development of anatomy. His chapter on Vesalius, the center of gravity of the book, gives a clear, detailed and informing account of the *Fabrica*, while the final chapter shows the

steps taken by Harvey in his great discovery. Singer is fair to Sylvius and Columbus: he gives handsome photographs of the recently exhumed Celsus copper plates, obtained from Sudhoff, and his section on Bion. Colter, Ruini and the other comparative anatomists of the 16th century is a new thing and of positive value. One cannot agree with our author, it is true, when he asserts that Paré was a shameless plagiarist (Paré's acknowledgment to Vesalius is both some and honorable) or that the crabbed Latin of the *Fabrice* is the spoken Latin of the period, but these are mere passing slips. The book closes with an unique "Vesalian Atlas," comprising 15 of the most important nudes, skeletons and muscle-men in the *Epitome* and the *Fabrice*.

F. H. GARRISON.

LIBRARY NOTES

Presentation of Dr. Brill's Library

Mrs. Brill has generously presented the library of her late husband, Dr. Nathan E. Brill, to the Academy of Medicine. We have thus come into the possession of a number of important books, some of which we did not have before and others which have been put on the shelves to take the place of those worn out. A few of the volumes received are given in the list below:

- Allbutt's System of Medicine, 9 volumes.
- Centralblatt f. Innere Medizin. 12 volumes.
- Deutsches Archiv f. Klinische Medizin. Volumes 47-108.
- Haller, Albertus. Physiology; being a course of lectures, 2 volumes, 1772.
- Hutchison, Robert & Rainy, Harry. Clinical methods... 1902.
- Journal of the American Medical Association, 12 volumes.
- Moore, John. A journal during a residence in France... 2 volumes, 1793.
- Nothnagel—Special Pathologie. 4 volumes.
- Sylvius [de la Boe] Franciscus. Opera medica... 2 volumes, 1635.

RECENT ACCESSIONS TO THE LIBRARY

- Army, H. V. Principles of pharmacy. 3. ed.
Phila. Saunders, 1926, 1078 p.
- Ash, E. L. Facts about stammering.
Lond. Mills, 1925. 64 p.
- Aub, J. C.; Fairhall, L. T.; Minot, A. S. & Reznikoff, P. Lead poisoning.
Balt. Williams, 1926, 265 p.
- Barcroft, J. The respiratory function of the blood. 2. ed.
Cambridge. Univ. pr., 1925, v. 1.
- Barnard, J. E., & Welch, F. V. Practical photo-micrography.
Lond. Arnold, 1925, 316 p.
- Barrett, (Sir) W. F. The religion of health.
Lond. Dent, 1925, 149 p.
- Basu, B. D. Diabetes mellitus and its dietetic treatment.
Bahaduroanj. The Panini off., 1925, 94 p.
- Beauvy, A. Sérums et vaccins.
Paris, Maloine, 1925, 117 p.
- Bergey, D. H. Manual of derminative bacteriology.
Balt. Williams, 1925, 462 p.
- Berkeley, W. N. The principles and practice of endocrine medicine.
Phila. Lea, 1926, 368 p.
- Borden, R. C., & Busse, A. C. Speech correction.
N. Y. Crofts, 1925.
- Bose, Y. M. Internal secretion in health and disease.
Lond. Butterworth, 1925, 550 p.
- Brillat-Savarin, J. A. The physiology of taste.
Lond. Davies, 1925, 326 p.
- Brown, L., & Sampson, H. L. Intestinal tuberculosis.
Phila. Lea, 1926, 304 p.
- Brown, W., & Thomson, G. H. The essentials of mental measurement. 3. ed.
Cambridge. Univ. pr., 1925, 224 p.
- Burt, C. The young delinquent.
N. Y. Appleton, 1925, 619 p.
- Calkins, G. N. The biology of the protozoa.
Phila. Lea, 1926, 623 p.
- Castiglioni, A. Il volto di Ippocrate.

- Milano. Soc. Ed. Unitas, 1925, 389 p.
- Cathcart, E. P.; Paton, D. N., & Pembrey, M. S. Practical physiology. 2. ed.
Lond. Arnold, 1925, 412 p.
- Crauford, L. The idle hours of a victorious invalid.
London. Chapman, 1925, 245 p.
- Delano, J. A. American Red Cross text-book on home hygiene. 3. ed.
Phil. Blakiston, [1925], 347 p.
- Devereux, J. R. Eating to banish disease.
Lond. Deniel, 1925.
- Driesch, H. Grundprobleme der Psychologie.
Leip. Reinicke, 1926, 249 p.
- DuPuy, W. A. Our insect friends and foes.
Phil. Winston, [1925], 275 p.
- Dutton, W. F. Intravenous therapy. 2. ed.
Phila. Davis, 1925, 594 p.
- Elwyn, H. Nephritis.
N. Y. Millan, 1926, 347 p.
- Evers, N. The chemistry of drugs.
Lond. Benn, 1926, 247 p.
- Fisher, A. G. T. Manipulation surgery.
Lond. Lewis, 1925, 168 p.
- Floyd, R. Kidney disease.
N. Y. Dougherty, 1926.
- Fothergill, W. E. A handbook for midwives and maternity nurses. 5. ed.
Edinb. 1925, 278 p.
- Frumusan, J. Beauty: how to regain and retain. Aesthetic treatment for race regeneration.
Lond. Bale, 1925, 124 p.
- Gans, O. Histologie der Hautkrankheiten. v. 1.
Berlin. Springer, 1925.
- Girdlestone, G. R. The diagnosis and treatment of tuberculosis of the hip.
Lond. Milford, 1925, 94 p.
- Goodhart, Sir J. F. The diseases of children. 12. ed.
Lond. Churchill, 1925, 966 p.
- Grover, B. B. High frequency practice.

- Kansas City. Election pr., 1925, 555 p.
- Hamer, (Sir) W. H., & Hutt, C. W. A manual of hygiene.
London. Methuen, [1925], 821 p.
- Hart, I. B. An introduction to physical science.
Oxford. Clarendon pr., 1925, 306 p.
- Henson, H. H. Notes on spiritual healing.
Lond. Williams, 1925, 197 p.
- Hill, S. C. A cook book for nurses.
Bost. Barrows, 1925, 76 p.
- Holland, A. L. Indigestion: what it is and how to prevent it.
N. Y. Appleton, 1926, 129 p.
- Horsley, J. S. Surgery of the stomach and small intestine.
N. Y. Appleton, 1926, 325 p.
- Hunt, H. E. How to train the memory.
London. Foulsham, [1925], 93 p.
- Iltis, H. Gregor Johann Mendel.
Berlin, Springer, 1924, 426 p.
- Kettle, E. H. The pathology of tumours. 2. ed.
Lond. Lewis, 1925, 285 p.
- de Kruif, P. Microbe hunters.
N. Y. Harcourt, 1926, 363 p.
- Lyon, G., & Loiseau, P. Formulaire thérapeutique. 13. éd.
Paris. Masson, 1925.
- McCollum, E. V., & Simmonds, N. Food, nutrition and health.
Baltimore. Authors, [1925], 143 p.
- Meakins, J. C., & Davies, H. W. Respiratory function in disease.
Edinburgh. Oliver, 1925, 478 p.
- Michaelis, L. Practical physical and colloid chemistry.
Cambridge. Heffer, 1925, 195 p.
- Morgan, C. L. Life, mind and spirit.
Lond. Williams, 1926, 316 p.
- Morton, G. F. Childhood's fears.
N. Y. Macmillan, 1925, 284 p.
- Murrell, W. What to do in cases of poisoning. 13. ed.
Lond. Lewis, 1925, 276 p.
- Myers, C. S., & Bartlett, F. C. A text-book of experimental psychology. 3. ed. Pt. 1 & 2.
Cambridge. Univ pr., 1925.
- Neustätter, O. Max Pettenkofer.
Wien. Springer, 1925, 93 p.

- Paul, F. T. Selected papers, surgical and pathological.
 Lond. Haillièrre, 1925, 284 p.
- Peck, A. W. [et al.]. Ears and the man. Studies in social work
 for the deafened.
 Phila. Davis, 1926, 217 p.
- Pieraccini, G. La stirpe de Medici di Cafaggiolo.
 Firenze. Vallecchi, 1925, 3 vols.
- Richardson, R. A. Increasing the strength of the eyes.
 Kansas City. Eyesight & health asso., 1925, 188 p.
- Richter, C. Human vibration.
 Harrisburg, Pa. Handy bk. corp., 1925, 216 p.
- Roederer, C., & Ledent, R. La pratique des déviations verté-
 brales.
 Paris. Doin, 1926.
- Rosenthal, O. Wunderheilungen und ärztliche Schutzpatrone in
 der bildenen Kunst.
 Leip. Vogel, 1925, 42 p. 102 pl.
- Ross, J. M. Post-mortem appearances.
 Lond. Milford, 1925, 216 p.
- Russell, E. H. & Russell, W. K. Ultra-violet radiation.
 Edinb. Livingstone, 1925, 262 p.
- Saudek, R. The psychology of handwriting.
 Lond. Allen, 1925, 288 p.
- Seres, M. Operatoria urologica.
 Barcelona. Aragones, 1925, 766 p.
- Sharp, C. G. K. Schistosomiasis vel bilharziasis.
 Lond. Bale, 1925, 74 p.
- Shearcroft, W. F. F. Matter, man and mind.
 Lond. E. Benn, 1925, 191 p.
- Sherrill, J. G. Peritonitis.
 N. Y. Appleton, 1925, 397 p.
- Shirokogoroff, S. M. Process of physical growth among the
 Chinese. v. 1.
 Shanghai, Commercial pr. 1925.
- Solomons, B. A handbook of gynaecology. 2. ed.
 Lond. Baillièrre, 1925, 303 p.
- Stammers, G. E. F. The fight against infection.
 Lond. Faber, 1925, 214 p.
- Sweeney, J. S. The natural increase of mankind.
 Balt. Williams, 1926, 185 p.

- Thom, C. & Fisk, W. W. The book of cheese. Rev. ed.
N. Y. Macmillan, 1925, 415 p.
- Thomas, J. The clinical study and treatment of sick children.
4. ed.
Edinb. Oliver, 1925, 912 p.
- Transactions of the Edinburgh obstetrical society, 1924-25.
- Transactions of the Medical society of the State of North Carolina, 1925.
- Wallis, T. E. Practical pharmacognosy.
Lond. Churchill, 1925, 115 p.
- Ward, E. Favorite prescriptions.
Lond. Churchill, 1926, 96 p.
- Watson, J. K. A handbook for senior nurses and midwives.
Lond. Oxford pr. 1926, 554 p.
- Wolff, E. Anatomy for artists.
Lond. Lewis, 1925, 174 p.
- Worcester, A. American red cross service in Switzerland
1918-19.
Boston. Four seas co. [1925], 90 p.
- Znaniecki, F. The laws of social psychology.
Chic. Univ. of Chic. pr. 1925, 320 p.
- Zoethout, W. D. A textbook of physiology. 2. ed.
Lond. Kimpton. 1926, 616 p.

A MEDIAEVAL KNOWLEDGE-BOOK

We have just procured from Germany a fine copy of another incunabulum to add to the collection of the Academy—"De Proprietatibus Rerum" by Bartholomaeus Anglicus, printed at Nuremberg by Koberger in 1483. It is beautifully printed in double columns upon paper which is as firm and clean as the day it was made. The text is in Latin and in the first initial letter of this copy, delicately illuminated by hand, a heron is depicted. The volume is bound in vellum and is unfortunately partly loosened at the back.

Bartholomew the Englishman (wrongly called B. DeGlanville by some) flourished between 1230 and 1250, but his exact dates are unknown to us, neither is the place of his birth or death revealed. He was a Minorite and was sent to Saxony to be a

teacher of holy theology to the Franciscan brethren there. He was also a professor of theology in the University of Paris.

This book "on the properties of things" constitutes an encyclopedia of knowledge of the middle ages and in manuscript it was one of the most popular books of the XIII and XIV centuries. It was probably written, as shown by internal evidences, about 1248. At present the earliest known MS., dated 1296, is in the Ashmole Collection in Oxford. The work was translated into French, Spanish, Dutch and English. It was first printed in 1472 (?) at Cologne and there were fourteen or more editions before 1500. The work consists of nineteen books, of which numbers 5, 6 and 7 are anatomical and medical. Bartholomew's sources of knowledge are Aristotle, Pliny, Isidore of Seville, Constantinus Africanus and many others whose names he appends in a list.

The following passage is given in English dress from the edition of Berthelet, 1535:

"Then consider thou shortly hereof, that a physician visiteth oft the houses and countries of sick men. And seeketh and searcheth the causes and circumstances of the sicknesses, and arrayeth and bringeth with him divers and contrary medicines. And he refuseth not to grope and handle, and to wipe and cleanse wounds of sick men. And he behooleth to all men hope and trust of recovering of health; and saith that he will softly burn that which shall be burnt, and cut that which shall be cut. And lest the whole part shall corrupt, he spareth not to burn and to cut off the part that is rotted, and if a part in the right side acheth, he spareth not to smite in the left side. A good leech leaveth not cutting or burning for weeping of the patient. And he hideth and covereth the bitterness of the medicine with some manner of sweetness. He drinketh and tasteth of the medicine, though it be bitter: that it be not against the sick man's heart, and refraineth the sick man of meat and drink; and letteth him have his own will, of the whose health is neither hope nor trust of recovering."

The seats of the various emotions and faculties are thus simply given:

"Some men ween, that the milt is cause of laughing. For by the spleen we are moved to laugh, by the gall we are wroth, by the heart we are wise, by the brain we feel, by the liver we love."

Robert Steele writes: "Our author affords perhaps the simplest way of learning what Chaucer and perhaps Shakespeare knew and believed of their surroundings—earth, air, and sea."

A. M.

CANDIDATES RECOMMENDED TO FELLOWSHIP
MARCH 3

Alvan LeRoy Barach, M.D.	19 East 64th Street
James Creighton Barker, M.D.	66 Trumbull Street, New Haven, Conn.
Milton Lionel Berliner, M.D.	35 West 52d Street
Sidney Cohen, M.D.	1955 Grand Concourse
James Francis Coughlan, M.D.	176 West 81st Street
Claude Granville Crane, M.D.	353 Washington Avenue, Bklyn.
Leonard Tomb Davidson, M.D.	667 Madison Avenue
Amed�� Joseph Debon, M.D.	850 Park Avenue
Joseph Ivimey Dowling, M.D.	116 Washington Avenue, Albany
Charles Daniel Easton, M.D.	63 East 64th Street
Solomon Fineman, M.D.	64 East 91st Street
Walter Guernsey Frey, Jr., M.D.	121 East 60th Street
Marius Greene, M.D.	47 Gramercy Park
William Vincent Healey, M.D.	48 West 82d Street
Harold Eliphalet Hoyt, M.D.	345 Edgecombe Avenue
Victor Jacques Jacobsohn, M.D.	701 West 175th Street
Robert Hayward Kennedy, M.D.	29 East 64th Street
Daniel Bartholomew Kirby, M.D.	30 West 59th Street
Isaac David Kruskal, M.D.	863 Prospect Place, Bklyn.
Alexander LaVigne, M.D.	471 Park Avenue
Richard John Lawton, M.D.	Terryville, Connecticut
Ray Robinson Losey, M.D.	9 East 46th Street
Arnold Messing, M.D.	944 Park Avenue
Grant Palmer Pennoyer, M.D.	114 East 54th Street
Mary Putman, M.D.	124 East 55th Street
Nicholas Sigmund Ransohoff, M.D.	116 East 58th Street
Edmund Jean Rhodebeck, M.D.	8 East 54th Street
John Elden Sawhill, M.D.	788 Riverside Drive

Herman Shann, M.D.	1453 Union Street, Bklyn.
Louis Lawrence Shapiro, M.D.	515 West 110th Street
Aaron Hood Thomasson, M.D.	8 East 54th Street
Joseph Francis Ward, M.D.	411—9th Street, Bklyn.
George Lewis Wurtzel, M.D.	1040 Park Avenue

DEATHS OF FELLOWS OF THE ACADEMY

John Winthrop Wright, A.B., M.D., 810 Myrtle Avenue, Bridgeport, Conn.; born in Cromwell, Conn., June 8, 1852; graduated in medicine from New York University in 1880; elected a Fellow of the Academy February 6, 1902; died February 10, 1926.

Thomas John Hillis, 35 Charlton Street, New York City, born in 1852; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1882; elected a Fellow of the Academy November 3, 1887; died February 21, 1926.

DONATIONS TO THE LIBRARY FUNDS

Donations and bequests are solicited by The New York Academy of Medicine for the maintenance and expansion of the Library.

A donation or bequest of \$5,000 or more will provide for a special library fund, the income of which may be used for the general purposes of the Library or restricted to the purchase of books and periodicals, as the donor or testator may indicate. When so restricted, a special bookplate will be used. A donation or bequest of less than \$5,000 but more than \$1,000 will provide for a named library fund, the income of which will be used for general library purposes or restricted for the purchase of books and periodicals, as desired by the donor or testator.

Donations of less than \$1,000 will be added to the general library funds.

FORM OF BEQUESTS

The following is a brief legal form as a suggestion under which bequests may be made in behalf of the Academy :

I give, devise and bequeath unto "The New York Academy of Medicine" of the City of New York, State of New York, a corporation duly incorporated by the Legislature of the State of New York by an act, entitled "An act to incorporate The New York Academy of Medicine," passed June 23, 1851, and amended June 4, 1853, June 2, 1877, and April 24, 1925

DATES OF MEETINGS

Stated Meetings of the Academy, 1st and 3rd Thursdays.

Trustees, 2nd Wednesday.

Council, 4th Wednesday.

Committee on Library, 2nd Tuesday.

Committee on Admission, 1st Wednesday.

Public Health Committee, Mondays.

Committee on Medical Education, 2nd Thursday.

Building Committee, 1st and 3rd Tuesdays.

Publication Committee, date varies.

Program Committee, date varies.

DATES OF SECTION MEETINGS

Dermatology and Syphilis, 1st Tuesday.

Surgery, 1st Friday.

Neurology and Psychiatry, 2nd Tuesday.

Pediatrics, 2nd Thursday.

Otology, 2nd Friday.

Ophthalmology, 3rd Monday.

Medicine, 3rd Tuesday.

Genito Urinary Surgery, 3rd Wednesday.

Orthopedic Surgery, 3rd Friday.

Obstetrics and Gynecology, 4th Tuesday.

Laryngology and Rhinology, 4th Wednesday.

Historical and Cultural Medicine, date varies.

COMMITTEES OF THE ACADEMY

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FREDERICK T. VAN BUREN, JR. ARTHUR M. WRIGHT
SAMUEL A. BRADBURY

Committee on Library

FRANK J. BLODGETT, *Chairman* J. RAMSAY HUNT
CHARLES A. ELSBERG RUSSELL L. CECIL
ERNEST G. STILLMAN

Public Health Committee CHARLES L. DANA, *Chairman*

Executive Committee

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JAMES B. CLEMENS	BERNARD SACHS	PHILIP VAN INGEN
LEWIS F. FRISSELL	FREDERIC E. SONDERN	GEORGE B. WALLACE
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		<i>Executive Secretary</i>

Committee on Medical Education JAMES F. MCKERNON, *Chairman*

Executive Committee

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HAVEN EMERSON	JOHN E. JENNINGS	JOHN O. POLAK
NELLIS B. FOSTER	ARNOLD KNAPP	FREDERICK P. REYNOLDS,
		<i>Medical Secretary</i>

GRACE CARSTENSEN, *Executive Secretary*

Building Committee

ARTHUR B. DUEL, <i>Chairman</i>	SIGISMUND S. GOLDWATER
SAMUEL A. BROWN	SETH M. MILLIKEN
CLARENCE C. BURLINGAME	WALTER L. NILES
CHARLES A. ELSBERG	FREDERICK T. VAN BUREN, JR.
	ARTHUR M. WRIGHT

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LEWIS F. FRISSELL, *Chairman*
EDWIN BEER J. BENTLEY SQUIER

Committee on Revision of the By-Laws

HERBERT S. CARTER, <i>Chairman</i>	ROYAL S. HAYNES
JOHN A. HARTWELL	FENWICK BEEKMAN

Committee on Publication

CHARLES L. DANA, <i>Chairman</i>	E. LIVINGSTON HUNT
FENWICK BEEKMAN	ALBERT R. LAMB
SAMUEL A. BROWN	FREDERIC E. SONDERN
CHARLES A. ELSBERG	GEORGE B. WALLACE

Program Committee

THE PRESIDENT	THE VICE-PRESIDENTS	THE DIRECTOR
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Officers of Sections

Dermatology and Syphilis

FRED WISE, *Chairman*
OSCAR L. LEVIN, *Secretary*

Medicine

EDGAR STILLMAN
DAVENPORT WEST

Surgery

FREDERICK W. BANCROFT
MORRIS K. SMITH

Genito-Urinary Surgery

FREDERICK T. LAU
STANLEY R. WOODRUFF

Neurology and Psychiatry

E. D. FRIEDMAN
THOMAS K. DAVIS

Orthopedic Surgery

HARRY FINKELSTEIN
ARTHUR KRIDA

Pediatrics

LOUIS C. SCHROEDER
WILLIAM ROPES MAY

Obstetrics and Gynecology

HARBECK HALSTED
HERVEY C. WILLIAMSON

Otology

J. MORRISSET SMITH
J. L. MAYBAUM

Laryngology and Rhinology

JOHN E. WELCH
ARTHUR NILSEN

Ophthalmology

CLYDE E. McDANNALD
THOMAS H. CURTIN

Historical and Cultural Medicine

L. PIERCE CLARK
CHARLES E. ATWOOD

TABLE OF CONTENTS

Editorial:

The history of cancer: FIELDING H. GARRISON	179
<i>Papers presented at the Stated Meeting of February 4th:</i>	
DRS. WILSON AND KOPEL, WYCKOFF, PARDEE.....	186
<i>Papers presented at the Stated Meeting of February 18th:</i>	
DRS. GOLD, OSGOOD, ELSBERG.....	192
<i>Papers presented at the section meetings:</i>	
Section of Otology, February 12th: DRS. DENCH, SHARPE, BERENS	202
Section of Obstetrics and Gynecology, February 23rd: DR. FROSCH	205
Section of Historical and Cultural Medicine, January 28th, February 25th: DRS. MORRIS, ARMSTRONG.....	207
Proceedings of Academy meetings	208
<i>Book Review:</i>	
Evolution of Anatomy.....	22
<i>Library notes:</i>	
Presentation of Dr. Brill's library.....	2
Recent accessions to the Library.....	2
A Mediaeval Knowledge-Book	2
Candidates recommended to Fellowship, March 3rd.....	
Deaths of Fellows of the Academy.....	
Donations to the Library Funds	
Form of Bequests	
Dates of Meetings	

BULLETIN
OF
THE NEW YORK
ACADEMY OF MEDICINE

INDEX

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INDEX

AUTHORS

- Albee, Fred. H., The orthopedic treatment of infantile paralysis, 463
- Amoss, Harold, Is epidemic poliomyelitis preventable and does a specific form of treatment of the disease exist? 456
- Andresen, Albert F. R., The treatment of chronic gall bladder disease, 306
- Armstrong, Donald B., Intimations of public health in early New York (Abstract), 207
- Bagg, Halsey J., An experimental study concerning the etiology of certain defects of the limbs, 318
- Beer, Edwin, Uric acid and uratic stones in the kidney: uric acid showers and diagnosis, 516
- Berens, Conrad, Papilledema in relation to ophthalmology, 203
- Blake, Joseph A., Difficulties in the reduction of fractures of the long bones and the principles of treatment, 249
- Brewer, George Emerson, William Kinnecut Draper, 174
- Clemens, James B., & Thompson, W. Gilinan, Carbon monoxid poisoning and the automobile exhaust, 402
- Crohn, Burrill B., The follow-up of one hundred cases of gastroduodenal ulcer, treated medically, 307
- Crowell, A. J., The curve of the 'phthalein excretion, its interpretation and clinical use, 517
- Dutton, Lucy P., & Hill, Miner C., Constipation, 521
- Dufourmental, Leon, M.D., The present status of plastic surgery in France, 267
- Dana, Charles L., The temples of Aesculapius with notes on incubator and the therapeutics of dreams, 344
- Nathan Edwin Brill, 171
- Darrach, William, Fractures in the aged, 247
- Delavan, D. Bryson, The founding and early history of the New York Academy of Medicine, 127
- Dench, Edward B., Papilledema from the viewpoint of the otologist (Abstr.), 202.
- Doane, Joseph C., Some considerations of the mode of infection and extension of erysipelas, 235
- Dochez, A. R., The occurrence of throat infection with streptococcus scarlatinae without rash, 511
- Draper, George, Can a pre-paralytic diagnosis of infantile paralysis be made and is there a successful therapy? 461
- Elsberg, Charles E., Bladder disturbances in brain and spinal cord tumors, 200
- Elwyn, Adolph, Studies in mediaeval anatomy, 270
- Eusterman, George B., Present status of chronic cholecystic disease and practical aspects of studies in hepatic function (Abstr.), Vol. II—No. 1—Jan., 1926—P. 14
- Feser, Joseph, Apraxia, 258
- Finney, John M. T., The surgery of gastric and duodenal ulcer, 546
- Frosch, Herman L., Sedimentation test an aid in obstetrics and gynecology (Abstr.), 205
- Garrison, F. H., Bacon's relation to medicine, 449
- The Academy of Medicine as a prime mover in quarantine legislation, 123
- The destruction of the quarantine station on Staten Island in 1858, 1
- The evolution of anatomy, by Charles Singer, M.D. (Review), 223
- The history of cancer, 179
- Laennec, 389

- Maude Abbott's Osler Memorials, 539
 Pest tracts and dream books, mediaeval, 381
 The reticulo endothelial system, 339
 Series and families of diseases, 491
- Gold, Harry, Disturbances of urination due to systemic diseases and drugs (Abstr.), 192
- Golden, Ross, and Levy, Robert L., Roentgen-Ray therapy in rheumatic heart disease, 313
- Goodman, Herman, History of phototherapy, 273
- Graves, Gaylord W., and Perkins, Charles Winfield, The thymus gland considered with reference to the advisability of routine preoperative X-ray, 261
- Gruehl, Helen Lee, Active and passive protein sensitization in utero, 365
- Hager, B. H., and Hagath, T. B., The role of a specific bacterium in the production of urinary calculi, 518
- Hanger, F. M., Dochez, A. R., and Shibley, G. S., Bacterial flora of nose and throat in health and upper respiratory infection, 265
- Harris, Thos. J., End results of tonsillectomy with special reference to the legal responsibility, 20
- Hill, J. H., and Young, H. H., Experimental and clinical proofs of the value of intravenous germicidal infections in local and general infections, 519
- Hill, Miner C., and Sutton, Lucy P., Constipation, 321
- Holden, Frederick C., Present-day gynecology at Bellevue Hospital, 242
- Huddleson, The part of conduct disorders in the concept of constitutional psychopathic inferiority, 257
- Jackson, Henry, Jr., The relation of protein to nephritis, 361
- Jackson, Holmes C., Active and passive protein sensitization in utero, 365
- Jarre, Henry L., Deposition and setting of intercellular substance in bone, 319
- Kopel, M., and Wilson, May G., The significance of the aneocyte count as an index of the rheumatic infection in children, 186
- Krida, Arthur, The symptoms and treatment of weak feet in young children, 320
- Lambert, Samuel N., Academy activities in our present building, 142
- Levy, Robert L., and Golden, Ross, Roentgen-Ray therapy in rheumatic heart disease, 313
- Liberson, F., Pneumoencephalomyelography, 259
- Long, Perrin H., Treatment of erysipelas with the serum of convalescent patients, 360
- Magath, T. B., and Hager, B. H., The role of a specific bacterium in the production of urinary calculi, 518
- Maliniak, Jacques, Prevention and correction of nasal deformities following submucous resection, 595
- Morris, Robert T., Evolution of the subject of appendicitis (Abstr.), 207
- Muller, Friedrich von, Observations during the period of under-nutrition in Germany, 502
- Northrup, William P., George Montague Swift (Abstr.), 172
- Pardee, Harold E. B., Use of digitalis in children with heart disease, 191
- Perkins, Charles Winfield, and Gaylord W. Graves, The thymus gland considered with reference to the advisability of routine preoperative X-ray, 261
- Plaut, Alfred, The relation of the histological pictures to prognosis in carcinoma of cervix uteri, 364
- Pollitzer, S., Pruritus—Cause, effects and treatment, 244
- Ratner, Bret, Active and passive protein sensitization in utero, 365

- Robinson, C. Allen, Radium therapy in diseases of the eyes adnexa, 308
- Robinson, M. R., The effect of Roentgen Rays upon the ovary, 594
- Sacks, Bernard, The mental and moral training of the normal child—The duties of physician, parent, and teacher—A critical analysis of modern trends and doctrines, 352
- Nathan Edwin Brill, 169
- Scudder, Dr. Cha. L., When is the operative treatment justified in the treatment of fractures of the long bones? 249
- Sharpe, William, The significance of papilledema in neurosurgery (Abstr.), 202
- Shibley, G. S., Hanger, F. M., and Dochez, A. R., Bacterial flora of nose and throat in health and upper respiratory infection, 265
- Soresi, A. L., Late results in empyema thoracis in children. Operated by the author's method, 259
- Stevens, Franklin A., and Dochez, A. R., The occurrence of throat infections with streptococcus scarlatinae without rash, 311
- Thompson, W. Gilman, and Clemens, James B., Carbon monoxid poisoning and the automobile exhaust, 402
- Troncoso, Manuel Uribe, Classification of retinal diseases, etc., 599
- Vincent, George E., The doctor and the changing order, 6
- Anniversary discourse, 6
- von Muller, Friedrich, Observations during the period of under-nutrition in Germany, 502
- Wearn, Joseph T., Coronary circulation and heart disease, 362
- Whipple, Allen O., The surgical criteria for cholecystectomy, 302
- Whiting, Frederick, X-ray examination as an aid to mastoid surgery, 264
- Williams, Linsly R., The future of the Academy, 147
- Wilson, May G., Studies of the prevention of rickets, 261
- Wilson, May G., and Kopel, M., The significance of the leucocyte count as an index of the rheumatic infection as manifested in children, 186
- Wyckoff, John, Certain observations on the course of rheumatic heart disease, 189
- Young, H. H., and Hill, J. H., Experimental and clinical proof of the value of intravenous germicidal infection in local and general infections, 519

SUBJECTS

- Academy activities in our present building, Samuel N. Lambert, 142
- Academy meetings, 1926, proceedings of section meetings, March, 252
- Academy meetings, 1926, proceedings of stated meetings, March, 251
- Academy of Medicine as a prime mover in quarantine legislation, The, F. H. Garrison, 123
- Academy building, opening the new, 329
- Academy, Proceedings of, 370
- Accessions to library, 36, 157, 226, 385, 442, 483, 525, 612
- Action on increased membership and the relations of the Academy to the Press, 533
- Active and passive protein sensitization in utero, Bret Ratner, Holmes C. Jackson and Helen Lee Gruehl, 365
- Admission, Committee on, 24
- American Hospitals in Paris, Internships in the, 166
- Anniversary Discourse, "The doctor and the changing order" (Abstract), George E. Vincent, 6
- Appendicitis, Evolution of the subject of (Abs.), Robert T. Norris, 207
- Appointment of a bibliographer, 156
- Apraxia, Joseph Feser, 258
- Art Committee, 151
- Attendance at Section Meetings, 148
- Auditor's report, 160
- Bacon's relation to medicine, F. H. Garrison, 449

- Bacterial flora of nose and throat in health and upper respiratory infection, G. S. Shibley, F. M. Hanger and A. R. Dochez, 265
- Bequests, Form of, 186
- Bellevue Hospital, Psychiatric service at, 329
- Birth control clinic (See population control), 171
- Bibliographer, Appointment of a, 156
- Bladder disturbances in brain and spinal cord tumors (Abstr.), Charles E. Elsberg, 200
- Book Review, 276
- Book Review, The evolution of anatomy by Charles Singer, M. D., F. H. Garrison, 223
- Book Review, Standard Bible Dictionary, 154
- Brill, Nathan E., 42
- Brill, Nathan Edwin (Obit.), Bernard Sacks, 169
- Bronson, Edward Bennet, 45
- Bulletin, Circulation of the, 164
- Bulletin, Daily Surgical, 178
- Calculi, The role of a specific bacterium in the production of urinary, B. H. Hager and T. B. Magath, 518
- Can a pre-paralytic diagnosis of infantile paralysis be made and is there a successful therapy? George Draper, 461
- Cancer, The history of, F. H. Garrison, 179
- Candidates, 30, 336, 534
- Candidates recommended to fellowship, 232
- Carbon monoxid poisoning and the automobile exhaust (Review of literature), (Report Com. on Public Health Relations), 402
- Carbon monoxid, 171
- Carcinoma of cervix uteri, Relation of the histological picture to prognosis in, Alfred Plaut, 364
- Cardiac children in the public schools, Report on segregated classes for, 487
- Causes, effects and treatment of Pruritus, S. Pollitzer, 244
- Ceremonies in connection with the opening of the new building of the Academy, 532
- Ceremonies, Committee on, 34
- Certain observations on the course of rheumatic heart disease (Abstract), John Wyckoff, 189
- Changes in By-laws, 24
- Charcot Exhibit, The, 31
- Child Health Day, 175
- Chiropractors, 174
- Cholecystectomy, The surgical criteria for, Allen O. Whipple, 303
- Cholecystic disease and practical aspects of studies in hepatic functions, present status of chronic, George B. Eusterman, 14
- Chronic Gall Bladder disease, The treatment of, Albert F. R. Andresen, 306
- City Health and Hospital Organization, 169
- Classification of retinal diseases, Manuel Uribe Troncoso, 599
- Clinic Population Control, 171
- Circulation of the Bulletin, 164
- Commissionership of health, 170
- Committees Facing inside cover
- Committees, 24
- Committee on Admission, Report of, 168
- Committee on Ceremonies for opening new bldg., 164
- Committee, Report of Building, 180
- Committee, on Library, Report, 163
- Committee on Medical Education, 166
- Committee on Public Health Relations—Report on segregated classes for cardiac children in the public schools, 487
- Committee on Public Health Relations—Report on. Carbon monoxid poisoning and automobile exhaust, 402
- Committee, Public Health, 152
- Consolidation of Municipal Hospitals Public Health Committee, 26
- Constipation, Miner C. Hill and Lucy P. Dutton, 321
- Communicable diseases of nervous system, 172
- Consolidation of Municipal Hospitals, 169
- Constitutional psychopathic inferiority, the part of conduct disorders in the concept of, James H. Huddleson, 257

- Constitution and By-laws, Proposed changes in, 22
 Convalescent Care, 171
 Cooperative activities, 174
 Coronary circulation and heart disease, Joseph T. Wearn, 362
 Council, Report of, 147
 Crippled children, Care of, 171
 Curve of 'phthalein excretion, its interpretation and clinical use, A. J. Crowell, 517
 Daily surgical bulletin, 178
 Dana, Testimonial dinner to Dr., 376
 Dates of meetings, 286, 186, 234, 187
 Donations to Liberty Funds, 233
 Destruction of the quarantine station on Staten Is. in 1858, The, F. H. Garrison, 1
 Deposition and setting of intercellular substance in bone, Henry L. Jaffe, 319
 Difficulties in the reduction of fractures of the long bones and the principles of treatment, Joseph A. Blake, 249
 Digitalis, Use of—in children with heart disease, Harold E. B. Pardee, 191
 Directory of convalescent homes, 283
 Disturbances of urination due to systematic diseases and drugs (Abstr.), Harry Gold, 192
 Doctor and the Changing order, The (Abstract) Anniversary discourse, George E. Vincent, 6
 Donations, 155
 Donations to the library funds, 186, 285
 Draper, William Kinnecut (Obit.), George Emerson Brewer, 174
 Dues and fee, 26
 Effect of Roentgen Rays upon the ovary, M. R. Robinson, 594
 Election of fellows, 178
 Empyema thoracis in children operated by the author's method, Late results in, A. L. Soresi, 259
 End results of tonsillectomy with special reference to the legal responsibility, Thomas J. Harris, 20
 Erysipelas, Some considerations of the mode of infection and extension, Joseph C. Doane, 235
 Etiology of certain defects of the limbs, An experimental study concerning the, Halsey J. Bagg, 318
 Evolution of the subject of appendicitis (Abstr.), Robert T. Morris, 207
 Exhibits, Committee on, 33
 Exhibit, The Charcot, 31
 Experimental and clinical proof of the value of intravenous germicidal infections in local and general infections, H. H. Young, J. H. Hill, 519
 An experimental study concerning the etiology of certain defects of the limbs, Halsey J. Bagg, 318
 Fees, Dues and, 26
 Fellows, Election of, 178
 Fellows of the Academy, 187
 Finances, 154
 Form of bequests, 186
 Follow-up of one hundred cases of gastro-duodenal ulcer, treated medically, Burrill B. Crohn, 307
 Form of bequests, 286
 Founding and early history of the New York Academy of Medicine, The, D. Bryson Delavan, 127
 Future of the Academy, The, Linsly R. Williams, 147
 Fractures in the aged, William Darraach, 247
 Fractures of the long bones and the principles of treatment, Difficulties in the reduction of, Joseph A. Blake, 249
 Gastric and duodenal ulcer, The surgery of, John M. T. Finney, 546
 Gastro-duodenal ulcer treated medically, Follow-up of one hundred cases of, Burrill B. Crohn, 307
 Germany, Observations during the period of undernutrition in, Friedrich von Muller, 502
 Gonorrheal vaginitis, 173
 Graduate study, Synopses of opportunities for, 177
 Gynecology at Bellevue, Present day, Frederick C. Holden, 242
 Health Dept. organization, 170
 Health environment and health control, Improvement in, 172
 Health problems of city, 169
 Heart disease, Coronary circulation and, Joseph T. Wearn, 362
 Historical Secretary, Report of, 161

- History of cancer, The, F. H. Garrison, 179
 History of phototherapy, Herman Goodman, 273
 Honorary fellows, 612
 Hosack bed, 182
 Hypertrichosis, X-ray treatment of, 173
 Illustrations, Bronson, Edward Bennett, 44
 Dr. Nathan E. Brill, 168
 Illustrations, Destruction of the quarantine station, Frontispiece
 Improvement of health environment and health control, 172
 Index medicus, Resolution in regard to the publication of, 156
 Infantile paralysis, Can a pre-paralytic diagnosis of—be made, and is there a successful therapy? George Draper, 461
 Infantile paralysis, The orthopedic treatment of, Fred H. Albee, 465
 Inscriptions on the new building, 608
 Intercellular substance in bone, Deposition and setting of, Henry L. Jaffe, 319
 Internships in the American Hospitals in Paris, 166
 Intimations of public health in early New York, Donald B. Armstrong, 207
 Investigations, Surveys and, 170
 Is epidemic poliomyelitis preventable and does a specific form of treatment of the disease exist? Harold Amoss, 456
 Jenner, Edward, Portrait of, 34
 Lectures and lecturers for practical lecture series, 1927, 610
 Lectures, popular, 174
 Legislation, 174
 Leucocyte count, The, as an index of the rheumatic infection as manifested in children. The significance of (Abstract), May G. Wilson, M. Kopel, 186
 Library, 150
 Librarian, 55
 Library, Committee on, 25
 Library, Accessions, 385, 226, 483, 525, 442, 157, 36
 Library, Moving the, 329
 Library, Needs of, 287
 Library notes, 383, 440, 329, 524
 Library notes, Presentation of Dr. Brill's library, 225
 Lincoln Hospital budget, 170
 Malloch, Archibald, 35
 Marriage laws in relation to minors, 174
 Mastoid surgery, X-ray examination as an aid to, Frederick Whiting, 264
 Maude Abbott's Osler Memorials, F. H. Garrison, 539
 Mediaeval anatomy, Adolph Elwyn, 270
 (A) Mediaeval knowledge book, "A. M.," 230
 Mediaeval pest traces and dream books, F. H. Garrison, 381
 Medical clinics, Weekly bulletin of, 179
 Medical Education, Committee on, 25
 Medical treatment of peptic ulcer, Herbert Swift Carter, 580
 Medico Literary works, 156
 Meetings, Dates of, 186, 537, 602
 Meetings, Proceedings of Academy, 322, 602
 Membership, Increased, 533
 Mental and moral training of the normal child, The, Bernard Sacks, 352
 Mental health, 172
 Municipal civil service commission, 175
 Moving the library, 329
 Neurology, 42, 162, 167, 233, 336, 388, 446, 534, 616
 New building, Ceremonies in connection with the opening of the, 532
 New building, Committee on 'ceremonies for opening of the, 164
 New building, The inscriptions on, 608
 New building, Opening of, 483
 N. Y. Academy of Medicine, its objects, future and development and financial needs, 394
 New York Academy of Medicine, The founding and early history of, D. Bryson Delavan, 127
 Normal child, The mental and moral training of the, Bernard Sacks, 352
 Nursing situation, 170

- Observations during the period of undernutrition in Germany, Friedrich von Muller, 502
- Occurrence of throat infections with streptococcus scarlatinae without rash, The, Stevens, Franklin A., and Dochez, A. R., 311
- Opening of the new building, 483
- Opening the New Academy building, 334
- Orthopedic treatment of infantile paralysis, The, Fred H. Albee, 463
- Osler Memorials, Maude Abbott's, F. H. Garrison, 539
- Papilledema from the viewpoint of the otologist (Abstract), Edward B. Deuch, 202
- Papilledema in neurosurgery, The significance of (Abstract), William Sharpe, 202
- Papers to be presented at stated meetings, 611
- Papilledema in relation to ophthalmology (Abstr.), Conrad Berens, 203
- Parthenon (illustration), 345
- Part of conduct disorders in the concept of constitutional psychopathic inferiority, The, James H. Huddleson, 257
- Peptic ulcer, Medical treatment of, H. S. Carter, 580
- Pest tracts and dream books, Mediaeval, F. H. Garrison, 381
- Phototherapy, History of, Herman Goodman, 273
- 'Phthalein excretion, The curve of; its interpretation and clinical use, A. J. Crowell, 517
- Plastic surgery in France, The present status of, Leon Dufourmental, M.D., 267
- Popular lectures, 174
- Pneumoencephalomyelography, F. Liberson, 259
- Population control clinic, 171
- Practical lecture series, 1927, Lectures and lecturers for, 610
- Present-day gynecology at Bellevue Hospital, Frederick C. Holden, 242
- Present status of chronic cholecystic disease and practical aspects of studies in hepatic function, George B. Eusterman, 14 (Abstract) Part I. Chronic cholecystic disease, —
- Part II. Hepatic functional tests, —
- Present status of plastic surgery in France, The, Leon Dufourmental, M.D., 267
- Prevention and correction of nasal deformities following submucous resection, Jacques Maliniak, 595
- Proceedings of the Academy, 370, 522
- Proceedings of the Academy meetings, 322, 252, 251, 209, 602
- Proposed changes in the constitution and by-laws of the N. Y. Academy of Medicine, 22
- Protein, The relation of to nephritis, Henry Jackson, Jr., 361
- Protein sensitization, Active and passive, in utero, Bret Ratner, Holmes C. Jackson, Helen Lee Gruehl, 365
- Pruritus, Causes, effects and treatment, S. Pollitzer, 244
- Public health relations committee, 402
- Psychiatric service at Bellevue hospital, 334
- Public health committee, 152
- Public health committee, Consolidation of municipal hospitals, E. H. L.—C., 26
- Public health in early New York, Intimations of (Abstract), Donald B. Armstrong, 207
- Public health relations, Committee on, 25
- Quarantine legislation, The Academy of Medicine as a prime factor in, F. H. Garrison, 123
- Quarantine station on Staten Island in 1858, The destruction of, F. H. Garrison, 1
- Radio health talks, Supervision of, 174
- Radium therapy in diseases of the eye adnexa, G. Allen Robinson, 308
- Recent accessions to the library, 36, 157, 226, 385, 442, 483, 525, 612
- Relation of the histological picture to prognosis in carcinoma of cervix uteri, Alfred Plaut, 364
- Relation of protein to nephritis, The, Henry Jackson, Jr., 361
- Religious healing, 170
- Report, Committee on Admission, 168

- Report, Auditors, 160
 Report of building committee, 180
 Report of historical secretary, 160
 Report of committee on library, 163
 Report of the committee on Medical Education, 175
 Report Public Health Committee, Abstract of, 168
 Report of Trustees, 154
 Resolution in regard to the publication of the Index Medicus, 156
 Retinal diseases, Classification of, Manuel Uribe Troncoso, 599
 Retirement of staff, 157
 Rheumatic heart diseases, Certain observations on the course of (Abstract), John Nyckof, 189
 Rickets, Studies of the prevention of, May G. Wilson 261
 Rockefeller Foundation, 155
 Roentgen-Ray therapy in rheumatic heart disease, Robert L. Levy and Ross Golden, 313
 Roentgen Rays, The effect of, upon the ovary, M. R. Robinson, 594
 Role of a specific bacterium in the production of urinary calculi, The, B. H. Hager and T. B. Magath, 518
- Sale of present building, 156
 Sedimentation test, The, an aid in obstetrics and gynecology (Abstract), Herman L. Frosch, 205
 Series and families of diseases, F. H. Garrison 491
 Significance of the leucocyte count as an index of the rheumatic infection as manifested in children (Abstract), May G. Wilson and M. Kopel, 186
 Significance of papilledema in neurosurgery, William Sharpe, 202
 Some aspects of the medical treatment of peptic ulcer, H. S. Carter, 580
 Some considerations of the mode of infection and extension of erysipelas, Joseph C. Doane, 235
 Standards of physical fitness of teachers, 171
 Stated meetings, March, Academy meetings, Proceedings of, 251
 Statistical report, Library, 165
 Studdiford, William E., 43
 Studies in Mediaeval anatomy, Adolph Elwyn, 270
- Studies of the prevention of rickets, May G. Wilson, 261
 Suites, A., 155
 Surgery of gastric and duodenal ulcer, The John M. T. Finney, 546
 Surgical criteria for cholecystectomy, The, Allen O. Whipple, 302
 Surveys and investigations, 170
 Swift, George Montague (Obit.), William P. Northrup, 172
 Symptoms and treatment of weak feet in growing children, The, Arthur Kride, 320
 Synopses of opportunity for graduate study, 177
- Teachers, Standard of physical fitness of, 171
 Temples of Aesculapius with note on incubator and the therapeutics of dreams, The, Charles L. Dana, 344
 Temple of Aesculapius at Epidaurus (Illustration), 346
 Temple of Aesculapius at Athens (Illustration), 348
 Temple of Aesculapius at Cos (Illustration), 349
 Temple of Aesculapius at Rome (Illustration), 349
 Testimonial dinner to Dr. Dana, 376
 Tetra-ethyl lead, 171
 Thymus gland considered with reference to the advisability of routine preoperative X-ray, The, Gaylord W. Graves and Charles Winfield Perkins, 261
 Tonsillectomy, End results of, with special reference to the legal responsibility, Thomas H. Harris, 20
 Treatment of chronic gall bladder disease, The, Albert F. R. Andresen, 306
 Treatment of erysipelas with the serum of convalescent patients, Perrin H. Long, 360
 Treatment of fractures of the long bones, When is the operative treatment justified in the, Dr. Charles L. Scudder, 249
 Trust funds, 182
 Trustees, Report of, 154
- Ulcer, gastric and duodenal, The surgery of, John M. T. Finney, 546

- Uric acid and uratic stones in the kidney, Uric acid showers and diagnosis, Edwin Beer, 516
- Urination, Disturbances of—due to systemic diseases and drugs (Abstract), Harry Gold, 192
- Use of digitalis in children with heart disease, Harold E. B. Pardee, 191
- Vaginitis, Gonorrheal, 173
- Venereal diseases, 173
- Ventilation of school classrooms, 172
- Weak feet in young children, The symptoms and treatment of, 320
- Weekly bulletin of medical clinics, 179
- Welfare Island (Blackwell's Island), Plans for development, 169
- When is the operative treatment justified in the treatment of fractures of the long bones? Dr. Charles L. Seudder, 249
- Whooping cough, 172
- X-ray examination as an aid to mastoid surgery, Frederick Whiting, 264
- X-ray treatment of hypertrichosis, 173

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EDITORIAL

THE ACADEMY OF MEDICINE AS A PRIME MOVER IN QUARANTINE LEGISLATION

The first quarantine regulation on record in the American colonies, occasioned by the Philadelphia epidemic of yellow fever in 1699, and promulgated by William Penn in the General Assembly at Newcastle, Pennsylvania (October 4, 1700) as "an act to prevent sickly vessels coming into this government." We have seen how the first quarantine establishment of New York was located by act of the Colonial Legislature on Bedloe's Island in 1758, to be removed successively thereafter to Governor's (Hutten) Island (1796) and Staten Island (1799). The burning of the Staten Island station on September 1-2, 1858, was followed by the destruction of quarantine buildings subsequently erected on the old quarantine burial ground at Seguine's Point, on the south side of the island (*circa* 1859), and thereafter, patients suffering from smallpox and ship fevers had to be transported by open row boats to the old steamship Falcon, purchased in 1859 and used as a hospital hulk until 1870, or to Blackwell's Island and Ward's Island, ten miles away. At this time, the Staten Island buildings were completely dilapidated, occupied only by squatters, and the health officer had to live in a house rented by the State for his use. In 1864, Dr. John Swinburne was appointed health officer. He disposed of the squatters, had the docks, buildings and hospital ship repaired and sent the patients to quarantine in steam craft, hired or purchased as a substitute for the dangerous or unseaworthy rowboats, in which patients sometimes died. After

much niggling and niggardly policy on the part of the legislature, Swinburne secured in 1866-70 the erection of a permanent hospital on a made island, subsequently known as Swinburne Island, surrounded and separated from the west bank of Staten Island by a massive rip-rap wall, and a detention station on Hoffman Island. Swinburne was succeeded by J. M. Carnochan (1870-72), S. O. Vanderpoel (1873-80), W. M. Smith, W. T. Jenkins and Alvah H. Doty (1895-1911).

During the seventies, eighties and nineties, the sciences of bacteriology and immunology had made rapid strides and the whole theory of preventive medicine was undergoing change, particularly through the location of transmission by human and animal carriers. Asiatic cholera had penetrated the United States in 1832, 1835, 1848-49, 1854, 1866-67, 1873 and subsequently. In 1911, it was easily controlled by isolation of carriers. The reports of the successive health officers, from Swinburne to Doty, are preoccupied with this theme and monotonously urge improvements and repairs for the stations at Swinburne and Hoffman Islands. It is at this point that the Academy of Medicine begins to loom large as a prime mover in promoting efficient quarantine.

On November 3, 1887, at the suggestion of the then Health Commissioner, Dr. J. D. Bryant, the President of the Academy appointed Drs. C. R. Agnew, Janeway, Jacobi, Stephen Smith and R. H. Derby as a Conference Committee, to cooperate with the Health Department on all matters relating to public health and welfare. In connection with the cholera question, a preliminary survey of the sanitary deficiencies of Swinburne and Hoffman Islands by Janeway, Edson, Biggs and Prudden brought forth a request from the Mayor for a definite inspection of these stations by the Committee and a report estimating the probable cost of necessary repairs and improvements. This inspection was made on November 19, 1887. The competent report submitted,¹ signed by Biggs and Prudden, as well as by the original Committee, showed the extent to which these stations had been permitted to lapse in respect of sanitary requirements and the many improvements necessary to repair these

¹ Sanitarian, N. Y., 1888, XX, 1-21.

deficiencies. These findings were confirmed in every respect by the subsequent report of the Quarantine Commissioners themselves and the report of the Health Officer (W. M. Smith). Each year, it seems, the budget of expenses for repairs had been favorably handled by the Legislature but disapproved by the Governor, at an ultimate loss or cost to the State of about two million dollars. The lot of health officers, through this long period, was evidently not a happy one, and several, notably Swinburne and Doty, were removed for political reasons. In 1888, however, a bill for repairs and improvements, including the important addition of a steam-disinfecting plant, was passed and approved by the Governor, and the report of the Health Officer (W. H. Smith) for 1891 indicated a very satisfactory state of affairs.

Two years later (1893), we find the Academy again active, this time in aid of the inevitable trend toward complete control of quarantine by the federal government, in connection with the growing need for wholesale revision of the notion of quarantine itself. As it began to be perceived that location of carriers was more essential than tyrannical detention of the healthy, the original concept (*quaranta giorni*) was fast becoming a misnomer.

The discoveries of Laveran (1880), Koch (steam sterilization 1882, cholera vibrio 1883), Ronald Ross (1897) and Walter Reed (1900) exposed the fallacies of prolonged detention and exploded the older theories of ship disinfection. Up to 1870, the Marine Hospital Service had labored under the burden of many "persons calling themselves physicians," appointed as local personnel for political reasons. Through the survey of Col. J. S. Billings, U. S. Army, who was detailed to the Secretary of the Treasury during 1869-74, to inquire into these conditions, the Marine Hospital Service was taken out of politics and acquired military organization and discipline, merging finally into the present Public Health Service of the nation (1912). The activities of the Academy during 1893-1915 helped to take the New York quarantine service out of politics and to make it a part of national and international sanitation. In connection with various bills for national quarantine successively introduced in Congress in 1892-93, the Committee appointed by the

Academy (1892) to frame and present a suitable bill did not get into action until the eleventh hour, and the bill eventually passed and signed by the President (1893) was somewhat incomplete and unsatisfactory. In connection with the bickerings of the then Health Officer (Jenkins) and the Marine Health Service over the cholera situation of 1893, sessions in the Academy had been stormy and the ultimate fiasco was regarded as a profound humiliation. At this time, the English principle of local isolation and sanitation vs. wholesale detention, was very ably defended by our master sanitarian, W. T. Sedgwick (1893).² Subsequent congressional legislation of 1894, 1901, 1902, and 1912 was negligible. In 1913, Dr. E. H. Lewinski-Corwin rendered a valuable report to the Academy, recommending that the New York quarantine station be transferred to the New Public Health Service, created by the act of 1912.³ The whole situation then acquired a new aspect through the outbreak of the European War. As most of the states had by this time turned over their quarantine stations to the federal service (*e.g.*, Georgia, 1899), the only ports of entry not under federal control in 1914 were Baltimore and New York. On April 10, 1915, under the presidency of Dr. Walter B. James, there was an important Academy meeting,⁴ at which the desirability of a turn-over was again stressed and in which ex-President Taft took part. It was urged that the port of New York is the great receiving and distributing station for immigrants and imports, controlled by the federal government in everything but quarantine (now logically a part of the immigration service), that decentralized (state) administration in quarantine or any other branch of sanitation is always bad administration; that quarantine in wartime becomes national and international rather than local, inasmuch as the federal government controls treaties; and that the Army, Navy and Public Health Service had demonstrated their capacity to control sanitation, whether in peace or in war. Our subsequent entry into the war in 1917 virtually placed the New York quarantine station under federal control, through the fact that the extra-cantonment areas of ports of embarkation and debarka-

² Sedgwick. Boston M. & S. J., 1893, CXXIX, 193.

³ Lewinski-Corwin: J. A. M. A., Chicago, 1913, LXI, 194-200.

⁴ J. A. M. A., Chicago, 1915, LXIV, 1607.

tion then came under jurisdiction by the Public Health Service. The necessity for such control was further emphasized through the post-bellum period, in which the twentieth century program of internationalization of hygiene grew apace, and meanwhile the official turn-over had already been made in 1916.

F. H. GARRISON

THE FOUNDING AND EARLY HISTORY OF THE NEW YORK ACADEMY OF MEDICINE

D. BRYSON DELAVAN

We have met to-night to commemorate the founding of The New York Academy of Medicine, to trace its history, and to celebrate the approaching consummation of what, three years ago, was pronounced by some to be a dream.

In the light of the past and in the promise of the future, the founding of the Academy was an event of profound significance, one of the most important in the history of American medicine. No time could be more appropriate than this for the contemplation of its past career, its present attainment, and its wonderful promise of development. To me, who have known it for so very many years, has been committed the privilege of recounting the principal events of its early days. This I do not only with deep interest but with genuine reverence, believing that, second only to one other, ours is the most sacred of all professions, and that our Academy more completely represents its lofty spirit and its wide-reaching beneficent influence than does any other medical institution. Indeed, we may well regard it as in very truth a Cathedral, a great Cathedral of the Art of Medicine. When all of its claims to that high distinction are considered, we must feel that the title is well merited, and that in our dealings with our splendid institution the dignity of this phase of its character should be ever kept in mind.

Of those who first conceived the idea of the Academy, and of their followers who have made it what it is, no appreciation can be too intelligent, no praise too great. Far be it that we of the present day should forget the Fathers or carelessly pass

them by. Before accepting as a matter of course the rich inheritance they have left to us, we should be interested in knowing who they were and under what conditions they labored.

The idea represented in what we call an Academy has from earliest times been applied to groups of men representing the most advanced intellectuality of the period in which they lived, associated together for mutual improvement and for the development and dissemination of useful knowledge. Plato, teaching in the famed groves of Acedemia, originated the name. From a group of learned men, founded by Ptolemy, grew the great Alexandrian Library. Centuries later, from such an academic association, sprang Oxford University. In later times, the prototype of our own institution was founded in France. In 1804 the name of an Academy of Medicine appeared in Paris, then the world's greatest center of advancement and education; but its existence was ephemeral. A more successful attempt was made in Paris in 1820, through the uniting of two societies of the highest standing, the Academy of Surgery and The Royal Society of Medicine, both of which had existed for more than a century. From this union, one hundred years ago, was created the present Academy of Medicine of France, of world-wide fame. For years it has been the forum to which all great questions in French medicine were brought and discussed, particularly famous as the scene of the epoch-making debates of Pasteur.

It is not strange that our foremost physicians who were seeking instruction in Paris at that brilliant period of the history of French medicine should have brought home with them the best and the most useful of the advanced ideas of the time. This doubtless explains the attempt to organize an Academy of Medicine in New York City in 1826. There is a published account of this effort which states that a meeting was held and a definite organization effected, with the following officers: Felix Fascalis, President; John B. Beck, John Watts, John Stern, and Joseph Mather Smith, Vice-Presidents; Daniel L. M. Peixotto, Secretary; Samuel W. Moore, Treasurer; and John Kearney Rogers, Curator. Its subsequent history is lost. No record is found to show that the institution was continued, and this attempt, although so well conceived, lay dormant for twenty years.

The year 1846 witnessed the birth of a veritable new era. In that year Horace Green, of New York, made his great discovery of the tolerance of the larynx to the presence of a foreign body, and thus became the originator of the science of Laryngology; Gurdon Buck, again of New York, advanced ideas and methods which gained for him the undisputed title of father of intralaryngeal surgery, besides adding other contributions to general surgery which have brought him enduring fame; while Morton made to the world the inestimable gift of ether anesthesia; Marion Sims discovered the principle of his speculum, thus establishing modern gynecology; a notable group united in founding the American Medical Association; and the New York Academy of Medicine was born. In reviewing the progress of American medicine, the year 1846 stands out pre-eminently as the most brilliant in its history.

Seventy-nine years ago, on November 18, 1846, at an anniversary meeting of the Society for the Relief of Widows and Orphans of Medical Men, held at Peletier's Saloon, on Broadway, the Delmonico's of the time, Dr. Alexander H. Stevens, in responding to the toast "The Medical Schools and Colleges of our Country," remarked "that the increasing unanimity in the corps would lead soon to the establishment of a Medical Hall, unconnected with hospitals or colleges, to contain meeting rooms, a library, etc., and be a place of general resort for ourselves and for our brethren from abroad."

Actuated by this suggestion a meeting of the profession, convened in obedience to a call in the public papers signed by a committee consisting of the late Drs. A. H. Stevens, Valentine Mott, and Isaac Wood, representing the Medical Colleges and the Medical Society of the County of New York, was held December 12, 1846, in the Hall of the New York Lyceum of Natural History, 561-65 Broadway, at that time the representative scientific institution of the city. Dr. Mott, in an earnest address, stated the object and purpose of the meeting, which was to promote that harmony and good will in the profession so essential to its advancement and the elevation of professional character. He was followed by Dr. Stevens, who, after pursuing a like train of thought, moved the reading of certain resolutions of which the following are extracts:

Resolved; that it is expedient to procure a building to be devoted to the Academy of Medicine, and that shall also be known as a hall, in which the regular members of the profession may meet on common ground.

Resolved; that a subscription be now commenced for this purpose.

Dr. Stevens again expressed the hope that the increasing unanimity of the profession would soon lead to the establishment of a medical hall, unconnected with hospitals or colleges.

Dr. John Watson, on the same evening, said that the imperfect action of the medical body depended upon the want of a proper place of meeting. If the profession would all set to work, we should soon have an ornamental and useful one. He hoped the time was not far distant when the medical clubs, or private societies, would come together; if so, the profession would be organized and we should be subject to no reproach.

Twenty years later, Dr. James Anderson said in addressing the Academy: "The great duty now resting upon us is that we secure a site and erect a building thereon that shall not only be an ornament to the city, but an honor to the Academy and the profession—a *Great Medical Center*, that shall be both attractive and scientific."

Following these initiatory meetings, The New York Academy of Medicine was formally instituted on the 6th day of January, 1847, and was incorporated by a special Act of the Legislature of the State of New York on the 23rd of June, 1851. The objects contemplated in its organization, as declared at the time, were:

First, the separation of regular from irregular practitioners of medicine.

Second, the association of the profession proper for purposes of mutual recognition and friendship.

Third, the promotion of the character, interests and honor of the fraternity by maintaining the union and harmony of the regular profession in the city and its vicinity, and aiming to elevate the standard of medical education.

Fourth, the cultivation and advancement of the science by united exertions for mutual improvement, and by contributions to medical literature.

Fifth, the procurement of a building, or hall, where meetings of the Academy may be held, where a library can be gathered, and where the profession may meet on common ground.

In other words, the cardinal principles upon which the Academy was based, are:

1. Cultivation and advancement of the science of medicine.
2. Promotion of the character and honor of the profession.
3. The elevation of the standards of medical education.

In less than two months from the time when the idea was first made public, the New York Academy of Medicine held its first regular meeting. This event occurred on February 3, 1847, at the Lyceum of Natural History, 561-65 Broadway. The meeting convened in obedience to a call in the public papers signed by Drs. Valentine Mott, Alexander H. Stevens, and Isaac Wood, as representatives of the three great medical associations of the city, namely the College of Physicians and Surgeons, the Medical Department of the New York University, and the New York County Medical Society. The object of the meeting was "To ask the cooperation of our medical brethren in an undertaking to elevate the character of our profession, to advance its interests, and to increase its usefulness by furnishing facilities for social intercourse, promoting harmony amongst its members, and the means of mutual improvement."

In the prosecution of this design, it was proposed to establish an Academy of Medicine and Surgery, and to provide a permanent place for its meetings.

Upon the adoption of the Constitution and By-Laws, about 130 physicians affixed their signatures to it. The following officers were elected: President, Dr. John Stearns; Vice-Presidents, Drs. Francis U. Johnston, Thomas Cock, Sr., John B. Beck, John W. Francis; Treasurer, Dr. Robert Watts; Librarian, Dr. Thomas W. Markoe.

Dr. Mott proposed the appointment of a committee to provide ways and means for "the erection of a hall for meetings."

Following the meeting of March 3, 1847, meetings were held until June, 1850, in the building 179 Wooster Street, near Houston, known as Convention Hall—a badly situated and uncomfortable place. The first anniversary address was delivered by

Dr. John W. Francis, the intellectual leader of his time, in the Broadway Tabernacle, a church of great capacity. The occasion called forth a large and imposing audience of representative men. The oration was a noteworthy production, full of interesting historical reminiscences. It ended as follows: "It is as identified with the future welfare of my country that I regard the institution of this Academy with pride and gratitude. Would that the feeble tribute to its grand objects which I have been permitted to offer were more worthy of the occasion. If it has awakened a single response in your hearts, or in any manner embodied your views, it will not have been in vain. Accept it, my fellow-associates, at least as a token of my candid and deep sympathy in the aims we cherish. May they be pursued with zeal and wisdom which shall ensure their realization, that those who reap the harvest we have planted may have cause to hold in lasting and grateful honor the Founders of the Academy."

From 1850 to 1860 the meetings of the Academy were held uninterruptedly in the building of the University of the City of New York, on the east side of Washington Square. The place of meeting was fairly attractive, and the meetings well attended. From 1860 to 1875 the Academy met in the College of Physicians and Surgeons, at the corner of Twenty-third Street and Fourth Avenue.

Many of the members possessed fairly extensive and carefully selected libraries of their own. The presentation of these to the Academy with the normal accumulation of new books resulted in rapid growth.

My acquaintance with the Academy began during my student days in the seventies, under the preceptorship of that eminent surgeon and great man, Dr. Willard Parker, at that time president of the College of Physicians and Surgeons and a leading spirit in every enterprise with which he was associated. The meetings of the Academy were then held in the lecture hall of the old college building, a room of gloomy and forbidding aspect, which offered a striking contrast to this airy and brilliant Hosack Hall. There, at stated intervals, the Fellows, a notable group, assembled to pass a quiet evening in the exchange of profes-

sional ideas and of social intercourse. It had from the first been intended that the Academy should have a building of its own, but as time passed and those in charge had grown old in service, the project dragged until it seemed that nothing would be accomplished. At this juncture the conditions were appreciated by Dr. Stuyvesant F. Morris, who at a certain annual election proposed for president the name of Dr. Fordyce Barker, and for treasurer that of Dr. Everett Herrick. No choice could have been more happy. Dr. Barker was a gentleman of great personal attractiveness, marked ability, wide knowledge of the world and strong social influence. Dr. Herrick was of the same type, personally well off, and an excellent financier. Both were devoted to the interests of the Academy and by their enthusiasm at once aroused a strong general interest and attracted a host of new and warmly interested friends, both medical and lay.

By the united efforts of the Fellows of the Academy and their friends and through the generosity of Dr. Abram Du Bois and some of Dr. Barker's wealthy patients, the hope of the founders was soon realized. The Academy was at last in a position to secure a home, a place where it could concentrate its work and assemble its library. From the day that it emerged from its chrysalis and entered the new building, it literally came to life.

The policy of the trustees had been to locate the places of meeting as near as possible to the center of the medical life of the city. As this moved up town from Wooster Street to Washington Square, thence to Twenty-third Street, they followed it. For the new home they selected the building No. 12 West 31st Street. It was an admirable choice. The house, a private dwelling, was easily remodeled for its new purpose.

The first stated meeting of the Academy in its own hall was held on Thursday, May 20, 1875, at eight o'clock, Dr. Samuel S. Purple, president, in the chair. It was made the occasion of a great celebration. Dr. James Anderson, chairman of the Committee of Ways and Means, made an address in which he summarized the long continued efforts (thirty years) of the members of the Academy to procure its own building. At the close of the reading of the report the legal documents relating to the ownership of the property were handed to the president,

who formally placed them in the hands of the chairman of the Board of Trustees, Dr. Oliver White, the physician and confidential friend of Mr. James Lenox and with him the organizer of the Presbyterian Hospital.

By 1880, the necessity for a commodious hall of meeting had become pressing. Dr. Du Bois at once authorized the construction of an annex for this purpose in the rear of the main building, as a gift to the Academy. The hall was given his name and is still perpetuated in our present building.

Moreover, the library was growing. Within five years from the time the new building was occupied the number of books amounted to 25,000 and the other activities and responsibilities of the institution had become important. All of the work connected with them had been carried on by a small group of its most zealous members, who now found themselves overburdened. The services of a professional librarian and general superintendent had become imperative. At the completion of the new hall in 1880 one was secured.

From the year 1880 the history of the Academy has been intimately identified with the life experience of one man. For nearly fifty years there has been behind its steady growth and prosperity an influence which has contributed vastly to its success. Quietly, without a suggestion of self-interest or obtrusiveness, that influence has been exerted for the upbuilding of our institution, with a singleness of purpose and a steadfastness of devotion for which it would be hard to find a parallel. To it, more than to any other individual factor, is due not only our material prosperity, but, even more important, that spirit of harmony which has characterized the Academy's contemporary existence. Men and groups of men in ever succeeding administrations have come and gone, each accomplishing their individual work. This influence, exerted with intelligence and wisdom, and with complete knowledge of all that had gone before, has caused each administration to glide quietly into the next, without friction and with no interruption to the routine. The management of the servants, the supervision of the building, the routine of the accounts, all have come under the hand and eye of that one executive, who, with the highly efficient aid of his

indefatigable assistant superintendent, Felix Wesstrom, in the execution of the details of the management has conducted the material affairs of the Academy with admirable quietness but with complete and uninterrupted success. Ever zealous in giving all possible aid, it was he who, representing the Academy, courteously received its casual visitors, aided in the plans for the entertainment of those especially honored, and in the arrangements for unusual functions of every kind. He it was to whom all of us resorted for information covering the entire range of medicine in general and the various activities associated with it, rarely failing to gain from him the desired knowledge or else to be directed with sympathetic courtesy to where it might be found.

The character and personality of the man have invariably attracted the best of those who have known him, both of the medical profession and of the laity, here and everywhere. He has gained not only their confidence and friendship but their unqualified support, thus in every way strengthening the institution, encouraging where encouragement was helpful, aiding by wise suggestion when consulted, and by hearty cooperation in the execution of the work. Through all the varying phases of nearly half a century, he has been the unfailing pilot of the Academy, its unwearied helper and friend. You, who know the Academy, will not need to be reminded that I am speaking of our Consulting Librarian and Superintendent, Mr. John S. Brownne, beloved and honored of us all.

Mr. Brownne comes of fine ancestry. His grandfather, Charles Brownne, a ship-builder by profession, came from England early in the last century and established a shipyard in New York City. He was commissioned by Robert Fulton to build the "Claremont," and thus became the maker of the first steamboat on record. Mr. Brownne's father, Robert H. Brownne, was Secretary and Librarian of the New York Lyceum of Natural History, the most influential scientific society of its time, itself an Academy in the highest acceptance of the word. From it was developed the now famous New York Academy of Science. Its membership included men of distinction in various departments of learning, among them Dr. Torrey, the well known founder of the New York Botanical Society, as well as a group

of leading physicians who, taking their inspiration from the successful methods of the Lyceum and, as aforesaid, following the example of the Academy of Medicine of Paris, conceived and developed our own Academy of Medicine.

Mr. John S. Brownne was born in King Street, Greenwich Village, New York, and after receiving an excellent education gained a position as Assistant Librarian in the Astor Library. When the Academy of Medicine moved into its new building in Thirty-first Street, its far-sighted officers at once recognized the possibilities of its growth and, upon the completion of Du Bois Hall in 1880, the necessity for a competent manager. Mr. Brownne's qualifications were carefully studied by them, and after long deliberation he was selected from among thirty other applicants. Already familiar with the routine of library work, and fully informed as to the intentions and ambitions of the Library Committee of the Academy, he entered upon the duties of his office with full appreciation of the magnitude of the enterprise and of its responsibilities, and a clearly expressed determination to make the infant project the best medical library in the world. In this ambition he had the enthusiastic support of the officers of the Academy, a group of gentlemen, led by Dr. Purple and Dr. Laurence Johnson, who possessed the culture, the knowledge, and the influence to bring about the desired results.

Books in considerable number were given by members, among whom was Dr. Purple, an ardent collector. For many years he had gathered complete files of American medical periodicals, until he had acquired the most nearly perfect files in existence. These he presented to the Academy. Dr. F. Wyce Barker was also a generous donor.

Some years before the Academy moved into the Thirty-first Street building, Dr. Frank P. Foster, editor of the *New York Medical Journal*, had established a society known as the Medical Journal Association, which had its quarters in the building 107 East 28th Street, at that time as now occupied by Tiemann and Company. By a friendly arrangement, the Journal Association was merged into the Academy, where it occupied the third floor of the new building and at once created for the institution its department of current periodicals.

Under the zealous efforts of Mr. Brownne, the Library increased rapidly in volume and in importance. Soon after the date of Mr. Brownne's appointment, Dr. John S. Billings was made Librarian of the Library of the Surgeon General of the United States Army in Washington, and thus at once Mr. Brownne found himself confronted by a powerful rival, as shown in the competition between them for desirable accessions. In these competitions Mr. Brownne often outbid his rival, funds being provided by enthusiastic members or by their generous friends. The most important acquisition came through the Governors of the New York Hospital who, in 1898, donated to the Academy the Library of the New York Hospital, numbering 23,000 volumes, a fine collection founded in 1798, in its last half century under the able direction of its Librarian, Mr. John L. Vandervoort.

This included the celebrated collection of rare old books on the history of medicine made by Dr. John Watson, which was the beginning of the Academy's present fine collection of incunabula.

Dr. Watson's anniversary address on "The History of Medicine" was the valuable contribution of a ripe scholar who had ample sources of reference in his own library.

Year by year, with steady increase, the Academy gained in reputation and influence. Its reliability was recognized, the dignity of its ambitions appreciated. The growth of its Library, according to the record, eloquently proves the esteem in which it was held. Thus:

1875, Total of books	21,720
1880, " " "	25,000
1900, " " "	49,830
1910, " " "	80,790
1926, " " "	139,320
1926, pamphlets	98,685
1926, journals subscribed for	1,500
Total	239,505

All of this has come about under the guidance of Mr Brownne, aided by the talent and devotion of his invaluable associate of

thirty-five years, Mrs. Laura E. Smith. They, throughout this long period of activity, have been the soul, the spirit of the Academy, quietly furthering its progress with rare wisdom and tact. If the fame accorded to Dr. Billings for the upbuilding of the second greatest Medical Library in the world is justly deserved, then equal credit is due to our own Librarian for the success of his life work in creating the Library of the Academy as it stands to-day, the third greatest of its kind, perfectly ordered and arranged according to the most advanced ideas of modern library organization.

But the Academy is rich not alone in its library. Since the beginning of its career it has been the repository of objects in large number pertaining to the history of medicine both in general and as relating to New York. These things consist of portraits of distinguished members of the profession; pictures; engravings; documents; surgical instruments; original models of instruments, etc. The number of these has increased to such an extent that they have become an important feature of the institution—indeed, next to the library its most interesting possession. They form a highly instructive Museum of Medical History acquired in the course of eighty years through the efforts and liberality of men of discriminating judgment and foresight. On no account must this feature of the Academy be slighted, still less given over to neglect. Aside from the very considerable intrinsic worth of our collections, their importance for the instruction and inspiration of ourselves and of the generations to come is inestimable. From every point of view, whether of practicality or of sentiment, they are priceless, irreplaceable treasures, for which we as present custodians will be held gravely responsible.

The history of the Academy from 1880 up to 1890 was that of steadily rapid growth, fortunately free from incidents which might have retarded its progress. One of historical interest was the famous discussion which arose over the proposed introduction of a new code of ethics, in the course of which a dangerous situation threatened to develop. At an important meeting of the Academy when the controversy was at its height, there occurred an incident noteworthy in its simplicity and its far-

reaching happy result. An excellent resolution had been offered but was being violently opposed by a few of the more zealous radicals. The result trembled in the balance. At this juncture, the late Dr. John C. Dalton took the floor. He was a man of most quiet demeanor, honored and respected wherever known. He said: "We are facing a serious crisis; the motion before the House will avert it. You cannot do better than to accept it; you might easily do a great deal worse." The question was carried by an overwhelming vote. The timely intervention of one wise man had saved the day.

While the affairs of the Academy were thus satisfactorily advancing, the medical world was rapidly developing the fundamental discoveries of Pasteur, and the adaptation of them by Mr. Lister to surgery. These, together with other important discoveries abroad, would of themselves have been amply sufficient to engage the attention of the Academy Fellows and to create lively interest in their meetings.

At home progress was no less active. Unquestionably one of the outstanding scientific contributions was that made by the late Dr. Joseph O'Dwyer who, adding to the discovery already made in 1846 by Dr. Horace Green, proved the tolerance of the human larynx to the continued presence of a foreign body, perfected intubation for acute conditions of laryngeal obstruction, developed a practical method for the cure of cicatricial stenosis and other chronic obstructions of the larynx, and first proposed the idea for the removal of foreign bodies from the trachea and bronchi, which laid the foundation of the modern art of bronchoscopy.

It was at this period that Wagner, Bosworth, Jarvis, Lefferts, Asch, Elsberg, Roe, Lincoln, Gleitsmann and French were doing credit to the Academy by their original work in the advancement of Laryngology; that the great surgeons of the Woman's Hospital of New York, Sims, Emmett, Peaslee and Thomas, were establishing gynecology; that general surgery was being brilliantly advanced by Sayre, Sands, Weir, Bull, McBurney, Dennis, Abbe Stimson, Gerster, Hartley, and other distinguished members; while in pathology and general medicine were men to-day illustrious—Delafield, Janeway, Trudeau, Leaming, Loomis, Peabody, J. Lewis Smith and Prudden.

With such material, the scientific proceedings of the Academy were replete with interest and profit.

From time to time distinguished visitors both from home and from abroad were received as guests of the Academy, particularly through the influence of Dr. Fordyce Barker. Like his eminent contemporary, Dr. William H. Van Buren, and others of their circle, Dr. Barker's acquaintance abroad was extensive.

Dr. Barker himself was one of the most genial of men. The sentiments of friendliness and hospitality had been fostered in the Academy from the day of its birth. He encouraged them and was aided in so doing by other generous members and friends. Foremost among these was Mrs. John Jacob Astor who, recognizing in the spirit of unanimity and friendliness an important factor in the success of the institution, gave to it the famous Loving Cup, now one of our most cherished traditions. Choicely preserved, the Cup was only allowed to grace occasions of unusual moment, to compliment a distinguished American or to welcome an honored foreign guest. To receive it, foaming with sparkling champagne, smiled upon by the beaming countenance of Dr. Barker, was something to remember. It well fulfilled its object in suggesting the importance of the social element of the Academy's life, at a later date so generously emphasized by Dr. Loomis.

But the Academy by no means confined its activities within its own walls. Then as now it interested itself loyally in the public good.

"From the first it became an advocate of the public welfare. It started agitations which gave New York better sewers; it founded a Board of Health; insisted on establishing sanitary police; built up a quarantine service; carried on a successful crusade against the milk supply from swill-fed cattle; caused the policing of the Croton watershed and constant analyses of the reservoir contents. Committees of the Academy campaigned against high infant mortality; and, due largely to its efforts, the American Medical Association established a special Section to advance the treatment of diseases of children. It vigorously opposed quackery, drafted a code of medical ethics, and so obtained the passage of license laws distinguishing between regular

and irregular practitioners. Its movement for the more complete isolation of cases of contagious diseases culminated in the founding of the Willard Parker Hospital. It became a pioneer in the new science of bacteriology, helped to introduce anti-toxins for diphtheria, advocated Pasteur's methods of inoculation, and promoted the use of serums and vaccines."

While the growth of the Academy was most satisfactory to its sponsors, it soon became evident that its constantly increasing activities would require space far in excess of that afforded by the new building. The generation under whose care the institution had been established in Thirty-first Street was passing away, but there were not wanting others ready and able to carry on the work, foremost among them being Dr. Alfred L. Loomis, Dr. Joseph D. Bryant, and Dr. Abraham Jacobi. Again financial aid was sought and obtained, plans were approved, and this present building was erected. The ceremonies attendant upon the laying of its corner-stone were made memorable through the presence of a notable company of more than 1,200 guests, including ex-president Cleveland, the Right Reverend Bishop Henry C. Potter, and the Rev. Dr. John Hall.

The history of the Academy from this period onward will be told by another.

In recounting the proceedings of those historic meetings at which the idea of an Academy of Medicine was first proposed and developed, it will be remembered that two propositions stand out with pre-eminent emphasis: the first related to the independence of the new institution, as already described; the second was no less important and fundamental, namely—that the institution should be a great *medical center*. This term has often been used, with various applications. In reality, the name was virtually reserved for the New York Academy of Medicine, when eighty years ago its early members made it fundamentally and from the very beginning a rallying point for all the great medical interests of this city. All reputable medical institutions gravitate toward it as to a central point of common interest and union. Logically, as well as in fact, like its famous prototype in Paris, it is our true Medical Center.

The independence of the Academy is a matter of far greater importance. From the beginning independence has been the

keynote of its action, the keystone of its success. Founded upon principles of the purest democracy, it has never been dominated by any interest, institution, or clique, either within the profession or without. In the broadest sense representing the medical profession of New York, to paraphrase a great expression, it has been, preeminently, an institution of the medical profession, by the medical profession, for the medical profession, and for the community at large, working without fear or favor for the elevation of the profession, the advancement of medical science, and the welfare of humanity. Its individuality has been sedulously guarded and preserved, its position in the community clearly defined and recognized. Unique among other reputable medical institutions and absolutely independent of any, it represents and supports them all. The watchword of its action has been service.

This spirit of service, actuating those who have gone before, has been splendidly exemplified in him who for the past three presidential terms has by his fine intelligence, rare foresight, indomitable energy and unsparing self-sacrifice, brought to a successful issue our dream of a new academy.

Thus, the fine ideals and lofty purposes of the founders of our institution have been realized in accordance with their most sanguine expectations. Highly altruistic in its conception, the Academy has from the outset been a temple of instruction, honored wherever known, a model widely imitated throughout the realm of scientific medicine. Always at the fore it still holds a place far in advance of any other of its kind. It is our steadfast hope and purpose that this well-deserved pre-eminence shall always be maintained.

ACADEMY ACTIVITIES IN OUR PRESENT BUILDING

SAMUEL W. LAMBERT

The Academy of Medicine occupied this site and held its first meeting in this building on November 30, 1890, when New York had still many characteristics of being a provincial town; limited theoretically to Manhattan Island but actually still bounded on the north by the Central Park and the belt line of

horse cars on 59th Street. Transportation in the city was exclusively by horse power except for the elevated steam car lines running to Manhattanville on the west and Harlem on the east side of the island. This was six years before Dr. F. P. Kinnicutt resigned from St. Luke's Hospital because that institution had removed so far away from his home to its new location at 113th Street.

The change from 31st Street to 43rd Street was not a long move but the improved physical conditions found in this building marked a great advance over those left behind in the two non-fireproof dwelling houses which had been remodelled for its use.

The new Academy of 1890 served a profession which was not an homogeneous body. Many legally qualified practitioners were ineligible for membership. It was divided into exclusive groups which wrangled over the proprietary medical schools, the appointments to hospitals, the code of professional ethics and the tenets of that drug dosing generation. The profession was divided into two camps which differed radically on therapeutic theories. One of the most important questions of that day was whether a nasty mixture of some twenty bitter drugs such, for example, as was compounded by a certain president of this Academy, or pills made up largely of sugar, were the cause of recovery from acute fevers, which were cured by nature in either case, through good diet, fresh air and good hygiene. This therapeutic schism which split the profession during the first 40 years of the life of the Academy, was waged over the so-called law of similars which neither side appreciated had been written by its wise, but illogical, author, in the subjunctive mood. In 1890 this Academy had just been through one of those internal squabbles over the code of ethics and the question of the legality of the medical degree of its own president. Fortunately this was the last of these unnecessary disagreements.

Since its occupation of this building these petty quarrels have ceased to trouble and the Academy has progressed, not always uniformly perhaps, but continuously, up to its present state of usefulness. It began this development under A. L. Loomis as president. Dr. Loomis shared with E. G. Janeway and Francis

Delafield the consulting medical practice of the town. Each of these great physicians stood in the public eye as the leading standard bearer of one of the three great medical schools of New York. All were prominent in the Academy and two were presidents. Loomis, who was especially responsible for the move to 43rd Street, had a high ideal for the Academy and an imagination for its development. Under the presidency of A. L. Loomis, the Academy was organized for scientific work largely on clinical lines. The number of sections has not changed very much but several were dropped. A section for anatomy, physiology and pathology, and others for materia medica and therapeutics and for public health, legal medicine and hygiene, disappeared entirely, while sections for newly developing specialties in pediatrics, in dermatology and in otology were added to the list. Recently a new interest has developed in a section on historical medicine and the total number of sections now is twelve. As president, Dr. Loomis took a great interest in the library in the development of which he was backed by such trustees and fellows as Abraham Jacobi, A. M. Jacobus, Landon Carter Gray, Everett Herrick and Rudolph Whitthaus. He founded by bequest a unique feature of this serious minded association. It is at Dr. Loomis's expense that the fellows of the Academy after every monthly meeting, eat, go thirsty, and are merry. Dr. Loomis, however, is not responsible for the thirst, for nothing was further from his thought in establishing the Loomis fund. The inside history of that fund records that cheering fluids were dispensed at the Loomis collations before the doctors of laws who rule this country decided that beverages which contain fifty-one one hundredths per cent. of alcohol, such as buttermilk, are intoxicating and that even beer has no medicinal value.

The development of the Academy has gone on during the past 35 years until the floor of the Academy has become the forum on which the best work of the profession of the city is presented for public discussion prior to general publication. The meetings in this building from the very first took on a serious scientific character and were presided over and attended by the leaders of the profession, "for these were honorable men in their gen-

erations." The keen analysis of the symptoms of disease and their relation to pathological anatomy characteristic of the work of Delafield; the diagnostic analytical power of Janeway; and the clear logic and therapeutic insight of Loomis, were felt in the meetings of the Section on Medicine. Clinical medicine was further represented by the careful painstaking work of A. A. Smith, Peabody, Draper, Kinnicutt, Jacobi, and McBride. The investigations of Prudden and Biggs, and of the younger men in their laboratories, added much to the new field of bacteriology and led to the foundation of the laboratories of the New York City Health Department which have become a model for similar municipal departments throughout the world. Advances in surgical technique, the epoch making work on the surgical treatment of appendicitis of Sands, Weir, McBurney, Bull, Bryant and Stimson, the additions to the surgery of the brain by Hartley, were presented to the world from this building.

The chief and outstanding feature of the present Academy is the library. Its great development is in part due to the fact that the New York Public Library retired from the medical field and left this important branch entirely to the Academy of Medicine. The library contains the literature of modern medical science. It has also a large collection of the works of the 17th and 18th centuries, a certain representation of the books of the 16th century, but is lacking in the incunabula which adorn the older medical libraries of Europe, of the Surgeon General's office, and the library of the College of Physicians in Philadelphia. It is one of the best working libraries of medical books in the world. It contains, in 1926, 139,320 books, and 98,685 pamphlets, as against the 21,720 books and pamphlets which made up the library in 1890. During the past 14 years the library has maintained a circulating department for the members which has grown, until last year there were loaned a total of 4,500 volumes to some 713 of the fellows.

Shortly after the old section on Public Health and Hygiene lapsed, the Academy organized a Committee on Public Health. It was a successful change, for this committee has earned for itself a high reputation and through it the Academy is now exerting an influence on municipal affairs and on the city gov-

ernment which was never thought of or planned at the time of its beginning.

The Academy during the past quarter century has extended to kindred societies and to benevolent associations linked to medicine, an invitation to occupy executive offices in this building. Among such allies one can enumerate the County and State Medical Societies, the Association for the Relief of Widows and Orphans of Medical Men, the Physicians' Mutual Aid Society. An office of the American Medical Association, that of the First District Dental Society, which has a supporting financial interest in the dental subdivision of the general library, several independent organizations including the Dispensary Development Committee and the Hospital Information Bureau also have permanent homes here. In addition many allied medical and surgical societies hold their scientific meetings and give their lectures in the assembly halls and meeting rooms of the Academy.

During the past 35 years New York has developed into the largest cosmopolitan city in the world and this Academy of Medicine has grown to measure up to its environment. It is no longer only a convenient meeting place for such members of a learned profession who might subscribe to an exclusive rule of therapy. Any legally qualified M.D. may become a member. The Academy is too busy with the broad study of every phase of the medical sciences to bother with petty jealousies or minor quarrels of any group of medical men. The plans for the future of this Academy have been brought to a remarkable and successful completion during the past eight years. The Academy can look forward to a future career in which it will represent a united profession with no distracting elements to check its future growth. Its rivals of thirty-five years ago have been eliminated. The hospitals have been reorganized so that all generations of medical men from the youngest to the oldest have an opportunity for service in hospital wards. The medical schools have joined the universities and look no longer exclusively to the medical profession for financial support and executive control. In 1890 the medical schools were the prominent representatives of the profession in New York but the more intimately the schools have been merged in the universities, the less influence they have re-

tained on the general profession and the greater the opportunities which have come to the Academy, until to-day it stands for the profession as never before. The profession looks to the Academy as its representative body in all things that pertain to its development, to its welfare and to the public interpretation of the advances, in all the medical sciences.

THE FUTURE OF THE ACADEMY

LINSLEY R. WILLIAMS, *Director*

Several interesting suggestions have been made of important activities which might be undertaken by the Academy. In considering those made by Fellows and in suggesting others, I would like to point out that these matters have not had the approval of the Council nor have they been submitted to the Fellows of the Academy.

Let me first comment on the suggestions which seem impracticable at the present time. It has been suggested that the Academy should take a deep and active interest in the subject of undergraduate medical education. To me this does not appear to be wise for the reason that the subject is being constantly studied by a Council of the American Medical Association which has facilities for obtaining information and disseminating it in a manner which can never be developed in the Academy. Further, undergraduate medical education constitutes an important activity of the General Education Board and the Association of American Medical Colleges. So we have three different groups—one the American Medical Association with facilities for obtaining information and distributing it, the General Education Board with funds to promote medical education, and the third with facilities for discussion representing all the medical colleges in the United States. For the Academy to enter this field would only add a duplication of effort and would not in my judgment be advisable.

Fellows of the Academy have suggested and even urged the development of a museum of anatomy and pathology and a collection of instruments and scientific apparatus and have re-

I hope sincerely that the library may be open to the public during the afternoon in order that we will have a true public library. With the size of the new reading rooms this should be possible.

It should be easier for the Fellows of the Academy to borrow books, so that a Fellow might telephone to the Academy and have a book delivered at his office and also collected.

It should be possible also to secure by telephone call a photostat copy of a certain page giving the original statement of an author, within a few hours time.

I would also like to see the usefulness of the library extended to other boroughs by cooperation with the Kings County Medical Library and by the development of reading rooms in the Bronx, Queens and Richmond.

In other words, why should not the Academy do everything in its power to bring the uses of the library to meet the particular and immediate need of the physician and the public?

A larger number of books for current use should be purchased and we should secure a larger collection of classical works and incunabula. We should subscribe to a larger number of journals and thus extend the list of books and journals of the Academy so that it would not be necessary to have recourse to the Surgeon General's Library. There are ample facilities for enlarging the library in the new building. The building is so arranged that additional stories may in the future be built over the main building which will permit the utilization of the section room immediately over the main reading room as an additional reading room or journal room, with immediate access to the stack. The stack will permit of expansion to such an extent that the Academy may house in time approximately a million books and pamphlets.

Medical Education—In the field of medical education there is but one thought which I believe we all have in mind for the future and that is that we should lend our efforts toward developing the facilities of New York to the end that it may become the greatest center for graduate study in the world. This is possible and needs constant study and application and earnest cooperation between medical schools and hospitals.

It should be possible for the Committee to secure up to date information as to courses of study available in all parts of the world and to be in position to advise not only foreign physicians in regard to opportunities in this country but also American physicians in regard to opportunities abroad.

Public Health Committee—The Public Health Committee has confined its labors primarily to investigations, studies and surveys and to giving advice on various matters affecting hospitals and the public health. It has not been feasible for the Committee nor has it been thought wise to follow up advice when given, nor to take an active part in securing the adoption of legislation affecting the public health of the city, state and nation. I believe that the time will come when the weight of the Committee's opinion followed up by an active interest in these matters will be of much value to our fellow citizens.

Relations to the Public—Instruction should be given to the public by means of the library and of lectures and exhibits. I have in mind not only exhibits commemorating the work of some famous physician, such as the exhibits we have held on Pasteur and the work of Charcot and Sir Thomas Browne, but also exhibits on the progress of medicine illustrating such simple subjects as acute appendicitis, accompanied by charts, drawings and models, and so on.

Many of these suggestions may never be realized, but I believe that most of them will be accomplished and in order to carry them out more funds will be needed. And I am sure that they will be obtained. In our new building we shall need for operation alone at least \$30,000 more a year than we are spending at the present time. We need a much greater endowment particularly for the library. Although when housed in the new building the Academy will have an endowment of over \$2,000,000, it would need nearly double that amount to carry on the activities which have been outlined above.

It is hoped that the Academy will increase its efforts, that its Fellows will be the leaders in the practice of medicine, in teaching, and in scientific research, and that the Fellows may be one united family resolved to carry out the original purposes for which the Academy was founded—to promote the art and science of medicine, medical education and the public health.

BOOK REVIEW

A NEW STANDARD BIBLE DICTIONARY¹

The well-known "Standard Bible Dictionary" appeared in 1909 and met with success and praise. For the present edition the whole work was set up again to allow of amplification and revision of the original articles and to make room for the new ones. The contributors do not represent any particular school of thought or creed but stand for what is best in American, English, and Canadian thought. One is inclined to agree; however, with the well-known statement that: "Every Scot is a theologian" for there are so many Scottish names amongst those of the contributors.

Everyone should be interested in the Bible for it is the most human book ever written. In it we find depicted the aspirations and strivings, the virtues and vices, the beliefs and superstitions, the faith and hopes, and the joys and sorrows of our fellow man. It should be part and parcel of our general education that we should know our Bible. To read it intelligently one requires an aid, a good concordance for instance, or better still this present dictionary.

Many doctors—we people who have to care for man through all the vicissitudes of life from the cradle to the grave—have been saturated with the literature of the Bible and a few have studied it so seriously that they have added much to our store of knowledge of it. It is said that to Jean Astruc (1684–1766) we owe the first fruits of textual criticism, namely, the distinguishing of the Elohist and Jehovist accounts of the creation given in the book of Genesis [*"Conjectures sur les mémoires originaux dont il paraît que Moïse s'est servi pour composer le livre de la Genèse."* Brussels (Paris), 12°, 1753].

Many physicians have written upon medicine in the Bible or upon medical questions suggested by its stories. One of the interesting and curious books was written by Thomas Bartholinus (1616–1680) upon the question of the wound in Christ's side

¹ Edited by Melancthon W. Jacobus, D.D., Edward E. Nourse, D.D., and Andrew C. Zenos, D.D. 965 pp. large 8°. New York and London, Funk & Wagnalls Co., 1926.

("De Latere Christi Aperto Dissertatio. Accedunt Cl. Salmasii, & aliorum, de Cruce Epistolae." Lugd. Bat. ex off. I. Maire, sm. 8°, 1646). Both Bartholinus and the distinguished scholar-physician Richard Mead (1673-1754) devoted books to the discussion of the diseases of the Bible, the former in his "De morbis biblicis miscellanae medica." Hafnae. 8°, 1671, and the latter in his "Medica sacra, sive, de morbis insignioribus qui in Bibliis memorantur commentarius" Londini, 8°, 1749. In the library of the Academy is to be found the volume by Jonathan Harle entitled: "An historical essay on the state of physick in the Old and New Testament and the apochryphal interval: with a particular account of the cases mentioned in scripture, and observations upon them." London, R. Ford. 8°. 1729.

The article on "Diseases and Medicine" in the Dictionary is a brief but comprehensive one written by the Dean of the Medical Department, The American University, Beirut, Syria. There is a very interesting section dealing with "Oriental Ideas regarding Disease" in which we see that these ancients regarded disease as sent by God and also that at the present time in the East certain deformities and defects are attributed to the 'evil eye.' To-day it is the goatherd who is the bonesetter, for he has frequent experience with the treatment of broken bones suffered by his herd and at the present time: "There is a self-trained specialist who operates for stone in the bladder, a trade so ancient and discredibly performed, that Hippocrates forbade it to his pupils in his oath for physicians." "Diseases of the Near East," "Knowledge of Anatomy and Physiology; Medical Practice," "Preventive Medicine," "Diseases of the Bible" and the "Healing Ministry of Jesus" are considered in other sections. Some of the diseases are discussed here as well as in separate articles. Any physician interested in a particular disease can readily discover, by the aid of this book, whether it occurs in the Bible. Of particular value are the references given to passages in the Bible which refer to plague and rats. The illustrations are excellent.

A. M.

APPOINTMENT OF A BIBLIOGRAPHER

Miss Wathy has been appointed to the staff of the Library in the position of bibliographer. She has had considerable experience for she has recently compiled extensive bibliographies of references on the subjects "Cerebellum" and "Sciatica." Sh is able to read six languages. For the present, Miss Wathy's services will be made use of chiefly for the benefit of the staff, but her unoccupied time is at present available for Fellows of the Academy. Later we hope to offer to the Fellows and library subscribers a much more extensive bibliographical service than has been possible heretofore. Plans for the undertaking of this work are being considered by the Committee.

MEDICO-LITERARY WORKS

The Library Committee feels that we should add considerably to our collection of non-medical books written by medical men and of books written by the laity which are interesting from a medical point of view. To display the varied activities of physicians other than their purely work-a-day ones is surely a function of the Library. The Librarian knows of a number of books which he would like to obtain but would be pleased to receive suggestions. Oliver Wendell Holmes used to speak of "the medicated novels" and we should have all of his own on our shelves as well as those of Weir Mitchell. There are many books of travel written by doctors which make good reading. It is very probable that many of the Fellows have some such books on their shelves which they have read and enjoyed and would be pleased to present to the Library.

RESOLUTION IN REGARD TO THE PUBLICATION OF THE INDEX MEDICUS

At a Stated Meeting of The New York Academy of Medicine held on January 7, 1926, the following resolution was passed:

WHEREAS, the Carnegie Institution has financed the publication of the Index Medicus at a considerable expense since 1903, and

WHEREAS, the Index Medicus has been of great service to many of the members of the Academy and to scientific workers and is consulted frequently as it is the only index of medical literature which is at all complete,

Be it RESOLVED, that The New York Academy of Medicine desires to convey to the Carnegie Institution of Washington its hearty appreciation of the service which has been rendered to the cause of medical progress and expresses the hope that nothing in the future will interfere with the publication of a complete reference index of medical literature and

Be it further RESOLVED, that a copy of this resolution be transmitted to the President of the Carnegie Institution.

RECENT ACCESSIONS TO THE LIBRARY

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- Bliss, H. T. Elements of applied electricity.
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N. Y. Crofts, 1925, 257 p.
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- Dawson, B. E. Orificial surgery.
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Roma. Stock, 1925, 995 p.
- Dieudonné, A. & Weichardt, W. Immunität, Schutzimpfung
und Serumtherapie. 11. Aufl.
Leipzig. Barth, 1925, 250 p.
- Dorsey, G. A. Why we behave like human beings.
N. Y. Harper, 1925, 512 p.
- Duken, J. Die Besonderheiten der röntgenologischen Thorax-
diagnostik im Kindesalter als Grundlage für die Beurteilung
der kindlichen Tuberkulose.
Jena. Fischer, 1924, 2 v. Text: 136 p. Atlas: 25 pl.
- Eldridge, S. The organization of life.
N. Y. Crowell, 1925, 470 p.

- Enfield, C. D. Radiography.
Phil. Blakiston, [1925] 299 p.
- Ethics (The) of birth control. Being the report of the special committee appointed by the national council of public morals . . .
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- Evans, C. L. Recent advances in physiology.
London. Churchill, 1925, 364 p.
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- Forgue, E. & Jeanbrau, E. Guide pratique du médecin dans les accidents du travail. 4. éd.
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COMMITTEE ON MEDICAL EDUCATION

The Committee on Medical Education has prepared two additional synopses of approved opportunities for graduate medical study in New York City: one on orthopedic, traumatic and rehabilitation surgery and physiotherapy, and one on neurology and psychiatry. The series of synopses now covers ten clinical subjects. A synopsis on pre-clinical or medical science subjects was published in September last.

The Committee has in preparation a guide which will describe opportunities for clinical study in New York hospitals. The booklet will contain maps, and there will be full directions for reaching each hospital. The special features and activities of the hospital of interest to visiting medical men will be mentioned such as cardiology, endocrinology, diabetes, physiotherapy, radium treatment, traumatic surgery, etc. Opportunities offered in the form of general and special internships, clinical clerkships, fellowships and assistantships will be described. Then will follow a statement of graduate courses, clinical conferences and clinics given at the hospital, with the day and the hour of each, and the name of the operator or medical man holding the clinic.

INTERNSHIPS IN THE AMERICAN HOSPITAL IN PARIS

Two vacancies are announced as available for interns in the American Hospital in Paris, which has just completed a new building giving it a total capacity of 120 beds. The service for interns begins January 1st, May 1st and September 1st and lasts for one year. The first four months are spent almost exclusively in work within the hospital. The last eight months are arranged so that one half of the individual's time is devoted to the hospital and the balance is spent in various other clinics in the City of Paris.

During the first four months the attending staff of the American Hospital will work out with the intern a schedule of the clinics which he wishes to attend during his last eight months

and will complete arrangements for him to secure work in the clinics that he chooses. This arrangement is made possible because there are a number of the members of the Faculty of Medicine of Paris on the staff of the American Hospital. On the conclusion of the individual's intern service the American Hospital will give an appropriate certificate and in addition the Faculty of Medicine of Paris will give a certificate covering the work which he may have done in the clinics outside of the American Hospitals of Paris.

Each intern will be given board, room and laundry during his entire year and he will receive in addition a salary of \$30 a month.

As the American Hospital in Paris has not as yet been approved for internships by the American Medical Association, for the present selections will probably be made of men who have already completed a general internship in the United States.

DEATHS OF FELLOWS OF THE ACADEMY

George Vickery Foster, 56 West 33rd Street, New York City; born in Flushing, Long Island, N. Y., February 25, 1855; graduated in medicine from Dartmouth Medical College in 1881; elected a Fellow of the Academy May 1, 1890; died December 16, 1925. Dr. Foster was a Fellow of the American Medical Association.

Thaddeus Halsted Myers, A.B., M.D., 59 West 50th Street, New York City; born in Yonkers, N. Y., August 31, 1859; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1884; elected a Fellow of the Academy February 6, 1890; died December 24, 1925. Dr. Myers was a Fellow of the American Medical Association, a member of the American Orthopedic Society, and a member of the Society of Alumni of St. Luke's Hospital. He was orthopedic surgeon at St. Luke's Hospital; consulting orthopedic surgeon at St. John's Hospital, Lying-In Hospital, New York Foundling Hospital, Vassar Brothers Hospital, State Crip. & Def. Child., and N. Y. Nursery and Child's Hospital; chief orthopedist at St. Luke's Hospital, O.P.D.

James Law, 15 East 127th Street, New York City; born in



DR. NATHAN EDWIN BRILL

Rhynie, Aberdeenshire, Scotland, March 18, 1854; graduated in medicine from the New York University Medical College, in 1891; elected a Fellow of the Academy October 2, 1913; died December 26, 1925. Dr. Law was a Fellow of the American Medical Association and a member of the Physicians Harlem Dispensary.

George Montague Swift, A.B., A.M., M.D., 178 East 70th Street, New York City; born in Brooklyn, N. Y., September 2, 1856; graduated in medicine from the College of Physicians and Surgeons, New York City, in 1879; elected a Fellow of the Academy January 2, 1890; died December 26, 1925. Dr. Swift was a Fellow of the American Medical Association and a member of the Society of Alumni of Bellevue Hospital and the Society of Alumni of the New York Foundling Hospital.

Julius Rudisch, 120 West 86th Street, New York City; born in Odessa, Russia, November 1, 1847; graduated in medicine from the University of Heidelberg, Germany, 1865; elected a Fellow of the Academy April 2, 1885; died January 30, 1926. Dr. Rudisch was a member of the Society of Associated Alumni of Mt. Sinai Hospital and consulting physician at Mt. Sinai Hospital.

NATHAN EDWIN BRILL

In the death of Dr. Nathan E. Brill, the medical profession and the community have suffered a real and serious loss. To a rare degree he combined the finer qualities of a learned physician with those of a man of culture and refinement. In his professional relations to his colleagues and to his patients he was the man of splendid acquirements, skilful in practice, upright and even aggressive in defense of his views, eager to advance medical science, justly proud of what he had achieved. He realized his obligations to the community in which he was born and bred, giving the best that was in him to every forward civic movement, and proving by his diverse activities that the medical man has unusual opportunities, if he will only avail himself of them, to be of great service to his fellow man.

Dr. Brill was born in this city January 13, 1860; he was trained in the public schools and was graduated from the Col-

lege of the City of New York, taking his degree of A.B. in 1877, and of A.M. in 1883. He studied medicine at the New York University Medical College; he received his medical degree in 1880. From 1879 to 1881 he was an intern at Bellevue Hospital. While devoting himself chiefly to the study and practice of general medicine, he took especial interest in neurology and in the early eighties, stimulated by close association with Edward A. Spitzka, did good work in the comparative anatomy of the nervous system, contributing to medical literature a very valuable monograph on congenital defects of the nervous system. Brill maintained his interest in neurological science throughout his life and was a familiar and welcome figure at many neurological meetings.

In 1893 Brill was appointed attending physician to Mount Sinai Hospital. During a period of over thirty years he was active and energetic as investigator and clinical teacher. Although fully alive to the progress of medical science, and aware of the importance of the biological and chemical laboratories in the study of disease, he developed keen clinical insight and belonged to that small and ever diminishing group of clinicians who believe that the diagnosis can and should be made at the bedside, and that observation of the patient is as important as are many of the laboratory tests.

His description in 1910 of the endemic form of typhus fever (now known as Brill's disease) revealed his skill as a careful medical observer. He maintained his interest in all forms of acute infectious diseases. Leucemia and all forms of blood disease exercised a special fascination over him. He was a true master in this domain. His articles on the Gaucher type of splenomegaly, his discussion of the diseases of the blood forming organs, his study of the value of splenectomy in thrombocytopenic (essential) purpura, showed his unusual grasp of an important series of newly recognized forms of disease.

Much more might be said to record his ability as consulting physician, to recall his excellence as guide to the aspiring medical youth. His services as clinical professor of medicine at the College of Physicians and Surgeons, his active participation in the work of the public health committee of the New York Acad-

emy of Medicine; his functions as vice-president and president of the medical board of Mount Sinai Hospital, his interest as a member in the affairs of many national and local societies, such as the American Medical Association, the Association of American Physicians, the New York Academy of Medicine, the American Neurological Association, and the Society of Medical Jurisprudence of which he was president from 1892 to 1894—all go to show that his talents were recognized and appreciated. Whatever Brill undertook to do he did well. His heart and soul were always in the task before him.

To his great chagrin, ill health prevented his going overseas; but he did his patriotic best in directing the work of Base Hospital No. 3. He was proud of his rank as major in the United States Army Medical Corps. At all times he was intensely American in his feeling and his judgment. In 1917 the first signs of the fatal illness appeared. Hampered as he was by loss of voice, he "carried on" for several years, displaying an indomitable will and enviable courage. His friend, the Rev. Stephen S. Wise, in paying tribute to his many good qualities, emphasized Brill's stoicism—"the courage of an uncomplaining gentleman, who in the face of adversity and trial and infinitely burdensome difficulties, faces life with that courage without bitterness which the world associates with stoicism." Those who visited him during his cruel illness will bear witness to his astounding patience when life had become a distressing struggle. His friends will think lovingly of Brill, the invalid; but they and all medical men will do better to pay homage to the man as he was in his prime and throughout his long and active career. Kindly, cheerful, forceful, a man of high ideals, a fine physician, and, above all, a fearless defender of truth.

BERNARD SACHS

(*N. Y. Medical Journal and Record*)

To the Editor of the BULLETIN:

I want to record my personal feeling and experience regarding the character of the late Dr. Nathan E. Brill.

For over fifteen years I worked with him and enjoyed his social qualities and his activities in our common purpose of promoting Academy efficiency. No one was ever more faithful in

his work or more fair and receptive in his understanding and judgment. He accepted all duties referred to him and carried on the work entailed with thoroughness and a disinterested desire for public good. I always felt that he would do his best and do it with loyal affection to the cause and with no desire for personal aggrandizement. No one has been taken from us whose loss has caused more regret or deeper feeling that a real element of effectiveness and personal charm has gone.

CHAS. L. DANA

GEORGE MONTAGUE SWIFT

Dr. Swift belonged to a family of doctors: his father was a doctor, his two brothers were doctors and his son is a doctor. Dr. William Swift, his father, graduated from Harvard in 1809, was surgeon in the navy for fifty-one years and was married at the age of seventy-two. He became the father of three husky boys and was seventy-eight years old when George was born. During the War of 1812 Dr. William Swift entered the service of the navy as the youngest kind of medical officer, rank not exactly defined, an assistant. He was present on the deck of the Chesapeake when General Lawrence gave the command "Don't give up the ship" and the scabbard of the general's sword has been recently presented by the Swift family to a museum.

Dr. George Montague Swift was born in Brooklyn, Sept. 2, 1856. His preparation for college in Riverdale, N. Y., and Amherst was followed by his graduation from Amherst College in 1876 and from the College of Physicians and Surgeons, Columbia, in 1879. After two years of service in Bellevue Hospital from 1879 to 1881, he studied in Vienna and Prague for two years and while abroad he was invited to come home to a position as house physician at the New York Foundling Hospital, without examination. My acquaintance with him, begun at medical college, was now renewed and our duties brought us into daily contact, working and lunching together.

It was just at this time that one of the happiest incidents of Dr. Swift's life occurred. At the period when many young doctors are wondering how they may make a start and make a living for the few first years, Dr. Henry F. Walker, whom he adored and who was the attending hospital physician at Bellevue, asked

him to become his assistant, an association which later developed into a partnership. Dr. Henry F. Walker was an exceptional family physician of the good, old-fashioned type; consequently when the two men became partners they were identified with that general practice already beginning to give place to the groupings of specialists. No two doctors of my acquaintance were more trusted and beloved than these. Of Dr. Walker it may be said that he probably took care of more doctors' families than anyone else in the city. His students in the hospital, among whom I may without risk refer to Dr. M. A. Starr, will testify that he was the beloved teacher and family adviser. It has been humorously said by a neighbor, Dr. John S. Thacher, "Walker and Swift fairly littered Fifth Avenue." In those days a doctor's carriage had a distinctive appearance and not so many vehicles were moving on the Avenue as in these times. Dr. Swift's hospital attachments consisted chiefly of his services as attending physician at St. Mary's Free Hospital for Children. Among his associates were Dr. Charles Poor and Dr. Charles N. Dowd, attending surgeons. Besides giving his time and attention to the ward service, he taught students from the College of Physicians and Surgeons. Children were always his special interest.

In 1887 Dr. Swift married Bessie Putnam Ely, of Brooklyn. Four children were born to them of whom three survive. Dr. Walker Swift, his son, carries on the name and professional inheritance of the partners, Walker and Swift.

In 1915 Dr. Swift suffered right-sided paralysis with almost total loss of speech, followed by slowly improving paralysis of the arm and leg. It was ten years later that he died and during that ten years his courage and cheerfulness were never failing. Although able to speak but a few words and walking with difficulty with the help of a cane, he was the sunny and plucky member of the household. By going to the opera, movies and lectures and by listening to reading (although he could not discuss), he kept himself informed. Even baseball was a fresh interest to him always. The activities of old friends in the profession were the delight of his life. After one evening of Christmas festivities he went to bed, having had a glorious day with family and grandchildren. Next morning on arising he fell to the floor and immediately expired.

Dr. Swift was a member of the following societies: American Medical Association, New York State and County Medical Associations, The Clinical Society, Harvey Society, Medical and Surgical Society, Academy of Medicine and The Century Association. Among his published works are the following: "Remarks on Adherent Pericardium" in The Medical News, February, 1903; "Chorea, a symptom, not a disease," in the American Journal of Medical Science, September, 1909; "Carditis" in the Medical Record, February, 1914.

When it comes to speaking of one's personal feelings after the death of a very dear old friend of fifty years, living as neighbors and practicing the same profession, the limits of propriety are binding. I cannot refrain, however, from characterizing George Swift as upright and clean. He was handsome and big in physical appearance, always neatly dressed and immaculate. He was clean in language and thought, charitable in his judgments of men and things, generous and sympathetic.

Dr. Swift was essentially a general practitioner, of the type which belongs to the age when the family had a medical adviser and a friend. When he came to be a patient himself, his old patients never ceased to show their sympathy and to shower him with evidences of their appreciation. Among many others the writer will ever regret the passing of the many-sided, brilliant, almost extinct class of wise counsellors and able family physicians among whom we may mention in loving memory the names of Henry F. Walker and George Montague Swift.

WILLIAM P. NORTHRUP

WILLIAM KINNICUTT DRAPER

"Twilight and the evening bell,
And after that the dark!
And may there be no sadness of farewell,
When I embark."

Happy the man, who has completed his span of life, and has crossed the Great Divide, while still in the full enjoyment of his mental and physical vigor. Still more fortunate will be the lot of that man, if it is permitted that the period of his crossing be brief, and without suffering. Such was the case of our loved and respected colleague, Dr. William Kinnicutt Draper, who in

the brief space of one-half hour passed from the restless activity of a busy professional life, to the calm repose of a peaceful death.

Dr. Draper, son of the late Dr. William H. Draper and Elizabeth Waldo Kinnicutt, was born in New York City on February 2, 1863. He died at his home, 121 East 36th Street, on January 5, 1926.

Dr. Draper's early education was received in private schools of this city, and later at the Adams Academy at Quincy, Massachusetts. In 1881 he entered Harvard College and was graduated from that institution in 1885. In the autumn of that year, he began the study of medicine in the College of Physicians and Surgeons, at that time located at the corner of Fourth Ave. and 23rd Street; and received his medical degree in 1888. Then followed two years of interneship at the Roosevelt Hospital, where he served as a favorite pupil and assistant to the late Dr. Francis Delafield. After finishing his service as house physician at Roosevelt, he passed a year or more in medical study at Vienna, Berlin, Munich, and Dresden.

On his return from Europe he began practice in New York City, in association with his father, Dr. Francis Kinnicutt, and Dr. Walter B. James. He quickly acquired the art of medical practice, partly by inheritance from his distinguished father, and in no small measure from association with his father's gifted colleagues.

It was fortunate for him that this association continued for several years; during which he gradually built up a personal following recruited chiefly from that large group of prominent New York families who had long sought medical advice and treatment from the elder Draper and his associates.

From this nucleus his practice has grown, and at the time of his death it could be said of him that he was one of the few distinguished medical men of New York, who had never adopted a specialty; but had retained to a remarkable degree the relationship of a general practitioner or family physician to his patients.

For this type of practice he was ideally fitted, for he had a sound training in internal medicine; was an expert diagnostician, always kept himself well informed in progress of medical science, and by his charm of manner and speech, by his deep personal

interest in the welfare of his patients, and withal by his courteous but at the same time firm control of every detail of treatment, he acquired to an extraordinary degree the confidence, esteem, and lasting gratitude of those under his care.

Few practitioners in this community at this period, of what may be termed excessive specialism, have enjoyed this old-time relationship with patients, which brought with it sympathy, appreciation, affection, and unquestioned loyalty.

Dr. Draper's first visiting appointment was that of attending physician to the City Hospital on Welfare Island. In 1902 he was made visiting physician to Bellevue Hospital. For many years he served as attending, and later as consulting physician to the New York Orthopedic Hospital. He was one of the original members of the medical board of the Minturn Hospital for contagious diseases, and continued to serve that institution until it was taken over by the City Department of Health.

In 1910 he was appointed professor of clinical medicine in the College of Physicians and Surgeons; and until his death, continued to give instruction in clinical medicine to students in the wards of Bellevue Hospital.

In all of these hospital services, he was diligent, conscientious, and kindly in his treatment of patients; untiring in his efforts to improve the efficiency of the ward service, and at all times genuinely solicitous for the physical and moral welfare of those under his care.

All this is well known by those who served with him. What perhaps is not as widely known is that during the entire period of his professional life he had constantly under his care a large number of private patients from the humbler walks of life, to whom he was not only their physician, but also their friend, general advisor, and their pillar of strength in emergencies of all kinds; and to whom he always gave the same measure of kindly and considerate treatment, as to his more prosperous patients. From these he received little or no pecuniary compensation; but such generous payments in appreciation, gratitude and affection, as is seldom given to a professional man in this day and generation.

Dr. Draper was keenly interested in all public welfare movements. He was a vestryman and a regular attendant at the

Church of the Epiphany. For many years he was a trustee and active worker in the Children's Aid Society. His interest in children and public health led him to accept a position as medical adviser to the Brearley and Miss Chapin's Schools. As early as 1913 he developed a system of cooperation with the medical advisers of other schools in the city; and inaugurated a series of conferences for the discussion of problems of health, hygiene, and preventive measures against contagious disease.

When our country entered the World War, he was made medical director of the draft in Local Branch No. 59, where he rendered constant and diligent service until the armistice.

Aside from his professional activities, Dr. Draper was a lover of nature and a keen sportsman; a member of the Boone and Crockett Club, and of the Tourilli Fishing and Game Club of Quebec.

Many of his short periods of recreation were passed in the woods of Canada, Maine, or the Rocky Mountains, following trails or canoe routes for moose, caribou, or elk; or searching for some lake or stream famed for its trout or ouananiche.

Dr. Draper was married in December, 1898, to Helen Fidelia Hoffman, whose efficient and constructive work in the National Red Cross Society during the Spanish and World Wars is well known, and a matter of public record. In this great national movement, Dr. Draper was as keenly interested as his energetic and gifted wife; and it was largely due to his advice, help, and hearty cooperation, especially during the period between these two wars, that Mrs. Draper was able to accomplish what she did in perfecting the organization and increasing the efficiency of the American Red Cross, which during the World War enabled it to meet so promptly the demands made upon it by the government, and to take such an active and important part in the activities of our army both here and abroad.

It was this cordial sympathy, understanding, and affection; and the help each rendered the other in their individual efforts to promote the public welfare; together with their charming personalities and their simple but whole-hearted hospitality, that made their home life such an ideal one, and drew to them such a host of admiring and devoted friends.

Dr. Draper exemplified the highest ideals of professional and social life. His personal dignity, his charm of manner, his sterling integrity, his professional generosity, and his high standards of personal honor and conduct, will long serve as an example to the younger generation of his followers.

GEORGE EMERSON BREWER

ELECTION OF FELLOWS

The following named candidates were elected to Fellowship at the Stated Meeting of February 4, 1926:

William Henry Boese, M.D., 531 West 143rd Street.

Frederick Parker Gay, M.D., 437 West 59th Street.

Charles Willard Lester, M.D., 51 East 50th Street.

Gerard Ludwig Moench, M.D., 30 East 58th Street.

Mervin Carueth Myerson, M.D., 198 Lincoln Place, Brooklyn.

TABLE OF CONTENTS

Editorial:

The Academy of Medicine as a Prime Mover in Quarantine Legislation: FIELDING H. GARRISON	123
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Addresses:

The Founding and Early History of The New York Academy of Medicine: D. BRYSON DELAVAN	127
Academy Activities in our Present Building: SAMUEL W. LAMBERT	142
The Future of the Academy: LINSLEY R. WILLIAMS	147

Library Notes:

Book Review. A New Standard Bible Dictionary	154
The Appointment of a Bibliographer	156
Medico-Literary Works	156
Resolution in regard to the publication of the Index Medicus	156
Recent Accessions to the Library	157
The circulation of the Bulletin	164
Committee on Ceremonies for opening of the new building	164

Committee on Medical Education:

Synopsis on orthopedic surgery and neurology and psychiatry	166
Opportunities for clinical study in New York hospitals	166
Internships in the American Hospital in Paris	166
Deaths of Fellows of the Academy	167
Election of Fellows	178

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* Deceased.

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SAMUEL A. BROWN	FREDERIC E. SONDERN
CHARLES A. ELSBERG	GEORGE B. WALLACE

Program Committee

THE PRESIDENT THE VICE-PRESIDENTS THE DIRECTOR

OFFICERS OF SECTIONS

Dermatology and Syphilis

<i>Chairman</i>	<i>Secretary</i>
FRED WISE	OSCAR L. LEVIN

Surgery

JOHN J. MOORHEAD FREDERIC W. BANCROFT

Neurology and Psychiatry

CHARLES A. MCKENDREE E. D. FRIEDMAN

Pediatrics

HOWARD H. MASON LOUIS C. SCHROEDER

Otology

ISIDORE FRIESNER J. MORRISSET SMITH

Ophthalmology

CONRAD BERENS DAVID H. WEBSTER

Medicine

HOWARD F. SHATTUCK EDGAR STILLMAN

Genito Urinary Surgery

WM. F. MCKENNA FREDERICK T. LAU

Orthopedic Surgery

SIGMUND EPSTEIN HARRY FINKELSTEIN

Obstetrics and Gynecology

EDWIN W. HOLLADAY HARBECK HALSTED

Laryngology and Rhinology

ANTONIE P. VOISLAWSKY JOHN E. WELCH

Historical and Cultural Medicine

I. PIERCE CLARK CHARLES E. ATWOOD

TABLE OF CONTENTS

Report of the Council	147
Report of the Board of Trustees	154
Abstract of Treasurer's Report	157
Report of the Historical Secretary	160
Report of the Committee on Library	163
Report of the Committee on Admission	168
Abstract of the report on activities of the Public Health Committee	168
Report of the Committee on Medical Education	175
Report of the Building Committee	180
Hosack Bed for Sick and Needy Physicians	181
Trust Funds of The New York Academy of Medicine	182
Donations to the Library Funds	186
Form of bequests	186
Dates of meetings	186
Dates of Section Meetings	187
Fellows of The New York Academy of Medicine	187
List of Candidates Recommended During 1925 for Election to Fellowship	220

Proceedings of the Annual Meeting

HELD JANUARY 7, 1926

THE NEW YORK ACADEMY OF MEDICINE

VOL. II

FEBRUARY, 1926

No. 2

REPORT OF THE COUNCIL

During the year 1925, the Council of the Academy has held eight regular and two special meetings and has exercised supervision over all the functions of the Academy.

Among the most important of these functions are the scientific sessions at the stated meetings and various section meetings. For some time it has been a matter of concern to the Council that the stated meetings have been poorly attended and the reasons for this have been studied. In connection with this study a meeting was held with the chairmen and secretaries of the sections. It was evident to all who attended this meeting that the increased number of medical societies, particularly the special societies, occupied a field in the medical life of the community which was not held by the Academy. It was felt that the preparation of the programs for the stated meetings was also an important factor in the attendance. Anticipating this, the president who has usually borne the brunt of the preparation of the programs, appointed a Program Committee in January, 1925, consisting of the three Vice-Presidents, Dr. Elsberg, Dr. Carter and Dr. Van-Beuren, with Dr. Elsberg as chairman. This committee, in conference with the section chairmen, has made a special effort to improve the programs and to a certain extent to coordinate the efforts of the sections.

Fifteen stated meetings and one special meeting were held during the year. The largest attendance was at the Carpenter Lecture, delivered by Dr. Lewellys F. Barker, when there was an

attendance of over six hundred. There was also an attendance of 525 at the Anniversary Discourse delivered by Dr. George E. Vincent. At two other meetings there was an attendance of over three hundred and at one an attendance of only thirty-three.

Four of the sections presented programs at the stated meetings—the Section of Otology, Laryngology, Neurology, and Medicine. It is expected that during the coming year a larger number of stated meetings will have programs presented by the sections.

Attendance at Section Meetings

The reports of secretaries of the sections show that during the year the average attendance at section meetings has been as follows:

Section of Dermatology and Syphilis	100
“ “ Surgery	77
“ “ Neurology and Psychiatry	105
“ “ Pediatrics	126
“ “ Otology	58
“ “ Ophthalmology	137
“ “ Medicine	174
“ “ Genito-Urinary Surgery	93
“ “ Orthopedic Surgery	86
“ “ Obstetrics and Gynecology	53
“ “ Laryngology and Rhinology	75
“ “ Historical and Cultural Medicine	80

The Section of Historical Medicine requested the Council to change its name to the Section of Historical and Cultural Medicine which was approved.

The regular folder containing the announcements of the meetings has been changed somewhat in form and improved and mailed several days earlier than previously.

Appointment of Committees

A special committee for the Study of Communicable Diseases of the Central Nervous System was authorized by the Council and the following Fellows of the Academy appointed: Drs.

Dana, Browning, Byard, Harris, Mason, Park, Tilney and Zabriskie. This committee has made some preliminary studies but has not been able to undertake any serious investigation owing to lack of funds.

The Program Committee was appointed as has just been outlined.

The Council authorized the appointment of a Committee on Publication to assist and advise the Director who was appointed Editor of the Bulletin of the Academy. The following Fellows of the Academy were appointed on this committee: Drs. Dana, Wallace, Sondern, Elsberg, E. L. Hunt, Beekman and Lamb.

The Committee on the Testimonial for Mr. John S. Brownne, consisting of Dr. Thompson as Chairman and the former chairmen of the Library Committee, was appointed by the council and as has been announced this committee presented Mr. Brownne with an engrossed resolution and a purse of \$5,318 which was supplied by 372 of the Fellows of the Academy.

A special committee was appointed to select a new librarian, consisting of the Chairman of the Board of Trustees and the Library Committee and the Director. After considering the qualifications of over twelve possible librarians the Committee finally recommended the appointment of Dr. Archibald Malloch, whose appointment was confirmed by the Council.

The Committee on the Opening Ceremonies was appointed late in the year, consisting of Drs. Brown, Camac, Conner, Darrach, Foster, Frissell, Goetsch, Libman, Lilienthal, Lyle, Cole, Stewart, Niles, Meyer, B. S. Oppenheimer, Sachs, St. John, Pool, Stockard, Ewing, Thompson, Vecchi, Lusk, Dana, Starr and James. This committee will meet early in January.

A special committee consisting of Drs. Carter, Bastedo and St. John was appointed to consider the formation of a new Section on gastro-enterology and this committee will first meet in January.

A special committee on By-laws was appointed by the President acting on the authority of the Academy, consisting of Dr. Carter, Chairman, Drs. Hartwell, Haynes and Beekman. This committee held a number of meetings and reported to the Council and the proposed changes were discussed in detail at several meetings of the Academy and will be presented to the Academy for action on January 7.

During the year there were two resignations, Dr. Elizabeth Mercelis and Dr. John Peters. Forty-seven Fellows have been recommended for election by the Committee on Admission and two Associate Fellows. The Committee on Admission has endeavored to secure all the information possible in regard to the increasing number of applicants for admission in the Academy. With this end in view a circular letter was sent to the Fellows of the Academy in June with a list of candidates whose names were before the committee. The letters received from various members of the Academy were of great assistance. A certain number of applicants were removed from the waiting list at the end of an eighteen months' period, but this has not in any way prejudiced the committee against these candidates as they were not acted upon because of lack of information and because preference was given to other candidates about whom more was known. The committee has also prepared a new form of application which will furnish the committee with a considerably increased amount of information which will materially assist them in reaching a decision in regard to candidates.

Library

Mr. John S. Brownne retired from active duty on August 1 and Mrs. L. E. Smith became acting librarian. Dr. Archibald Malloch has been appointed librarian and commenced his duties January 1st.

During the year the Council has approved of a revision of the regulations in regard to the library prepared by the Library Committee.

A copy of the accession list, containing the title and the name of the author of every book and the title volume and number of every journal which the Academy possesses, has been placed in a vault at the Guaranty Trust Company so that in case of damage to the catalogue or to the Library, a duplicate is always available at a place outside of our building.

During the year 5,135 new books were purchased and 1,732 received by donation.

At the present time there are 139,320 books including bound journals. There are 98,685 pamphlets and reprints.

The circulation of the journals was the largest in the history of the Academy, 3,708 and the circulation of books amounted to 4,500, exceeded only in 1921. There were 33,425 readers and this number was exceeded only in 1921 by 865. 3,150 old or worn out volumes were bound.

The Building Committee consisting of Dr. Duel, Chairman, Drs. Goldwater, Burlingame, Niles, VanBeuren, Wright, Stewart, Milliken and Elsberg has held eighteen meetings during the year and has been most assiduous in its duties and its desires to secure the best building possible for the Academy. A report of the Building Committee states that the building is progressing satisfactorily under the direction of the architects, York & Sawyer, and that the contractors, Marc Eidlitz and Son, have been most cooperative and that the services of the engineer, Mr. Sutton, have been highly satisfactory. The building is approximately 30 per cent finished and within the total estimated cost. Sub-contracts to the amount of \$958,540 have already been let.

A special Art Committee was appointed to cooperate with the Building Committee, consisting of Drs. Dana, James and Holden. This committee has given careful study to the selection of the inscriptions that will be placed on the facade of the Academy and has given a great deal of attention to the sculptural detail and various other matters relating to the decoration of the interior.

The committee believes that the Academy will be able to move into the new building, barring strikes or accidents, before the end of the year.

Under the supervision of the Committee on Medical Education, the Bureau of Clinical Information has published without interruption a daily bulletin of surgical clinics, averaging 133 operations from 29 hospitals, performed by 78 surgeons. There are 281 paid subscriptions to this bulletin and about 20 copies are sent daily to physicians and surgeons temporarily in the city. The weekly bulletin of medical clinics was discontinued early in the year and instead the list of clinics has been published in Medical Week, clinics at 23 different hospitals being posted.

Advertisements announcing the facilities of the Bureau have been inserted in the Journal of the American Medical Associa-

tion, the Journal of the Canadian Medical Association and in the American Journal of Medical Sciences.

During the year 520 visiting physicians have registered at the Academy, coming from 46 different states in the Union, and from Porto Rico, Hawaii, from 8 Canadian provinces, 11 Latin American countries, from 15 countries of Europe, 6 of Asia, from South Africa, Australia, and New Zealand.

Synopses of opportunities for graduate study in the fields of ophthalmology, oto-laryngology, medicine, surgery, urology, obstetrics and gynecology, dermatology and syphilology, and pediatrics have been distributed to a specially prepared list of 650 physicians and also to medical societies, libraries, journals and hospitals.

Special internships and residencies in hospitals have been studied and efforts are being made to secure the names of all foreign physicians of note who are planning to visit the United States.

A list of endowed lectureships in various medical schools and hospitals has also been compiled as has other data relating to graduate medical study in the United States and abroad, looking toward the wider development of the Academy as a center of information on graduate study.

Public Health Committee

The Committee on Public Health which was organized under its present name in 1914 has continued its activities in accordance with the resolution voted by the Academy on December 3, 1914, which reads as follows:

RESOLVED, that the President be authorized to appoint each year a Committee to be known as the Public Health Committee, and to fill such vacancies as may occur in it, or make such additions as may seem best. This Committee shall be authorized to cooperate with public health activities and to make studies of and issue statements upon matters pertaining to public health and hospitals; but such statements shall not be issued until approved by three-fourths of the Committee and by the President of the Academy of Medicine. Subject to these provisions and in pursuance of these objects, the Committee is authorized to appear before any committee, board, legislative or other body, in order to make statements and express opinions on matters relating to public health and hospitals.

Under these general directions the Committee on Public Health carried on the following activities during the year 1925:

The Committee worked out a plan for the consolidation of the municipal hospitals other than those for communicable diseases.

It has considered a plan for the future development of Welfare Island and has given a great deal of study to the organization of the Health Department. The Committee advised the city authorities to take over the Lincoln Hospital and also studied the budget provided for that hospital after it had been taken over by the city during the year.

Conferences were held on the nursing situation and the problems which enter into the situation are still under consideration. An investigation of religious healing has been inaugurated. Reports on standards for convalescent care have been prepared and published.

The Committee has also made a study of poisoning by tetraethyl lead and was represented at a conference in Washington called by the Surgeon General to consider this matter. A study and report on carbon monoxide poisoning resulting from automobile exhaust gas has also been made.

At the request of the Department of Education, a report on the standards of physical fitness for teachers was made and submitted to the Board of Education.

Consideration has been given to the various phases of the problems of mental hygiene, communicable diseases of the nervous system, whooping cough, venereal disease and X-ray burns.

A report was forwarded to the Surgeon General at his request in regard to the definition and classification of still births.

An amendment to the autopsy law was sponsored which was adopted by the legislature of 1925.

The Committee has also cooperated in a study on the consolidation of the Federal Health Service, the marriage laws in relation to minors, and in the supervision of radio health talks. Assistance was given in the promotion of popular lectures on health and in the selection of medical examiners of candidates for positions in the city medical service and in a number of less important matters.

Upon the invitation of the Mayor-elect, the Executive Committee authorized the Chairman to appoint a committee to wait upon the Mayor-elect to advise him on the qualifications necessary for a Commissioner of Health. This committee, consisting of Drs. Chas. L. Dana, George David Stewart, James Alexander Miller, G. B. Wallace, J. A. Hartwell, Linsly R. Williams and E. H. L.-Corwin, waited upon the Mayor-elect on December 24. The Mayor-elect discussed the matter confidentially with the committee and submitted a list of persons recommended to him, asking the committee to indicate which ones were qualified. On December 28 the committee submitted a verbal report to the Mayor-elect stating that certain individuals on his list possessed the qualifications of public health and administrative experience which would fit them for the position. The action of the subcommittee was unanimously approved by the Executive Committee on December 28 and by the whole committee on January 4th.

REPORT OF THE TRUSTEES

Present Building

The Trustees report what is a matter of common knowledge that the present building is very much worn out and in order to make it habitable, it has been found necessary to expend about \$1,600 for important repairs. To insure the heating of the building it was necessary to re-line the fire-box and repair a certain number of steam pipes during the summer. The elevator is frequently out of commission and has to be repaired from time to time. The increased overcrowding of the Library made it necessary to provide extra space for books in the reading room.

The floor covering and furniture are in very bad condition but the Trustees have felt it an extravagance to renew anything in the old building except those things which are necessary to keep it in operation as the Academy will soon go to a large expense for furniture and fixtures for the new building.

Finances

The mortgage on the 510 Park Avenue building amounting to \$500,000 has been paid off with interest in accordance with the

agreement. The Treasurer, acting on the authority of the Trustees, has invested this money in guaranteed mortgages or certificates, in Library and other bonds. Bonds which have been purchased will be sold for the payment for furniture and fixtures of the new building and for necessary moving expenses, in accordance with the instructions of the Academy.

Bequests

Under the will of Dr. A. W. Suiter, of Syracuse, his library of 1,200 volumes is left to the New York Academy of Medicine. This library has been received. A residuary bequest of \$3,000 for a lectureship on medical jurisprudence and public health is also left to the Academy.

Under the will of Dr. E. B. Bronson, of New York, a bequest of \$5,000 is made to the Academy without restriction.

The residuary bequest from Dr. Suiter's estate and an offer of another lectureship on a specific subject were seriously discussed by the Trustees and were referred to a committee consisting of the three Vice-Presidents, who reported that bequests or donations for lectureships on specific subjects to be given before stated or section meetings of the Academy, restricted the Academy in building up sound programs, and it was deemed unwise to accept bequests or donations for lectureships thus restricted. This recommendation was accepted by the Trustees and it was agreed that donations of this kind which limit the efforts of the Academy should not be accepted.

A proposal was also received from a prospective testator to provide a fund, the income of which was to be used for research in medicine or surgery, restricting the workers and their direction to individuals of certain religious faiths. The Trustees were unanimous in agreeing that such a bequest could not be accepted and adopted the following resolution:

RESOLVED: That no bequest made in terms which limit its application to any race, creed or faith will be accepted.

Donations

During the past year the Academy has received the sum of \$33,500 from the Rockefeller Foundation for the maintenance of

the Bureau of Clinical Information, for surveys made by the Public Health Committee, for the salary of the Director and his clerical expenses and for the compilation of the Union Check List. The Carnegie Corporation voted an extra \$550,000 to be added to the fund for the construction of the new building.

Donations for the Public Health Committee were as follows: \$7,500 from Mrs. E. H. Harriman, \$1,000 from the Hartley Foundation, \$1,000 from the Altman Foundation, and an anonymous gift of \$100.

Sale of Present Building

A contract was arranged for the sale of the present building in in April for the sum of \$745,000. \$50,000 was paid on signing the contract and \$10,000 additional was to be paid every six months and the balance upon delivering the property. The agreement also provides that the property may be delivered to the purchaser on six months' notice on any date from January 1 to May 1, 1927, or from January 1 to May 1, 1928. The cash paid by the purchaser is held as a forfeit and interest thereon is being returned to the purchaser at the rate of 4%.

Budget

At the December meeting of the Board of Trustees, the budget for 1926 was adopted as follows:

Administration and Direction	\$ 33,900.00
Operation of the Building	27,392.00
Corporation Expense	17,655.00
Maintenance of Library	50,800.00
Bibliographic Service	8,000.00
Committee on Public Health Relations	13,070.00
Committee on Medical Education and Bureau of Clinical Information	17000.00
Carpenter Lecture	319.72
Gibbs Prize Fund	1,230.02
Loomis Entertainment Fund	440.00
A TOTAL OF	\$169,806.74

This budget is based upon an anticipated income of \$168,378.78 for the year 1926.

Retirement of Staff

The retirement of Mr. John S. Brownne after forty-four years of service brings to the Trustees the consideration of retirement of other members of the Academy staff which may occur in the future. It does not seem possible that each and every member may receive a purse so generously provided by the Fellows of the Academy for Mr. Brownne, and the Trustees are seriously considering the possibility of providing a retirement allowance at the expense of the Academy for those members of the staff who may have served thirty years, or more or by equal participation by the Academy and members of the staff in the Teachers' Annuity and Insurance Fund.

ABSTRACT OF THE TREASURER'S REPORT FOR
THE YEAR ENDING DECEMBER 31, 1925

The income of the Academy for the year 1925 was \$23,007.61 more than in 1924 and the last two months of 1923. This increase in income was due almost entirely to the sale of the 60th Street property and the investment of the difference in the sale price and the cost of the 103rd Street site.

This additional income paid off the deficit of \$24,737.58 remaining December 31, 1924.

The expenses of the Academy for the year 1925 were \$128,638.30, a slight increase over 1924 and the year ended with a deficit of \$2,294.56.

It is expected that the Academy may still have a slight deficit at the end of the year 1926.

Attention is called to the fact that since 1917 the expenses of the Academy have more than doubled and its educational activities largely increased and that the work of the Committee on Public Health, the Committee on Medical Education and the Bureau of Clinical Information has been maintained at an increased cost to the Fellows. The maintenance and operation of the present building costs \$27,000 annually. In the new building this expense will be more than doubled. New funds will have to be secured for this purpose if the Academy is to function without a deficit.

ASSETS AND LIABILITIES

Assets

Cash in Banks:

Income of Funds\$ 23,372.53

Less principal (overinvested)..... 683.62

\$22,688.91

Director's Special Account 2,000.00

\$ 24,688.91

Cash in Office 25.00

Investments:

Bonds and Mortgages 982,417.78

Real Estate:

43rd Street Property 384,326.59

222 E. 83rd Street 7,500.00

5th Avenue-103rd Street 227,548.58

619,475.17

Construction-5th Avenue-103rd St. 528,648.95

Library 80,000.00

Estate of Dr. Charles A. Powers 1,513.98

Account of Construction 20.00

\$2,236,789.79*Liabilities*

Deposits Re Sale of 43rd Street\$ 60,000.00

Less Commissions, etc. 9,050.00

\$ 50,950.00

Principals of Trust Funds 897,052.48

Principals of Other Funds:

Academy Extension Fund 133,908.88

New Site and Equipment Fund... 507,061.44

640,970.32

Reserve for Construction 528,648.95

Mortgage, 17 West 43rd Street 100,000.00

Prepaid Dues 105.00

Unexpended Income of Restricted

Funds 21,357.60

Less Academy Deficit, Dec. 31,

1925 2,294.56

Balance of Unexpended Restricted Income..... 19,063.04

\$2,236,789.79

SUMMARY OF ANNUAL STATEMENT
Income

Unrestricted	\$ 87,262.47	
Restricted:		
Library Funds	15,283.60	
Public Health Committee	9,850.00	
Rockefeller Appropriations:		
General Survey	\$ 4,768.31	
Direction and Librarian's Salary	16,579.27	
Bureau of Information	11,423.12	
Bulletins	3,126.88	
Union Check List	1,800.00	
	<hr/>	37,697.58
Carpenter Lectureship Fund	352.11	
Gibbs Prize Fund	1,098.45	
Loomis Entertainment Fund	734.86	
	<hr/>	\$152,279.07
Plus Balances, Jan. 1, 1925	20,159.85	
	<hr/>	\$ 172,438.92

Expenditures

Operation, Administration, Corporation Expense	\$ 47,948.49	
Library	38,794.31	
Public Health and General Survey	12,618.31	
Direction	12,094.35	
Bureau of Clinical Information and Committee on Medical Education	16,423.12	
Carpenter Lecture, 1925	319.72	
Collations	440.00	
	<hr/>	\$128,638.30
Plus Deficit, Jan. 1, 1925	24,737.58	
	<hr/>	\$ 153,375.88

Restricted Income Surplus, Dec. 31, 1925.....\$ 19,063.04

Less Balances in Restricted Income:

Rockefeller Revolving Fund	\$ 6,775.12	
Public Health and General Survey	4,085.53	
Carnegie Medical Education	7,835.36	
Gibbs Prize Fund	1,814.98	
Carpenter Lectureship Fund	81.89	
Loomis Entertainment Fund	475.96	
First District Dental Society Fund	288.76	
	<hr/>	\$ 21,357.60

DEFICIT, Dec. 31, 1925.....\$ 2,294.56

SUMMARY OF BUILDING ACCOUNT

Builder's Certificates	\$448,470.74	
Architects' Fees	68,027.70	
Consulting Architect's Fees	9,990.51	
Consulting Engineer's Fees	2,160.00	
		\$528,648.95
Received from Carnegie Corporation	528,648.95	

SETH M. MILLIKEN,
Treasurer.

AUDITOR'S REPORT

We reconciled the cash in bank, and verified the cash on hand by actual count.

All receipts were traced to the bank and disbursements accounted for by checking the amounts shown on the Cash Book with the Vouchers and cancelled checks, and we feel convinced that the Income and Funds of the Academy have been accurately administered and fully accounted for.

W. B. DICKENSON & Co.

REPORT OF THE HISTORICAL SECRETARY

I have the honor to present the following report, as Historical Secretary, for the year 1925:

During the year, the following organizations have maintained their offices in the Academy buildings:

Committee on Dispensary Development.

Hospital Information Bureau.

Medical Society of the County of New York.

Medical Society of the State of New York.

Physicians' Mutual Aid Association.

Society for the Relief of Widows and Orphans of Medical Men.

Meetings have been held in the Academy buildings by these organizations:

American Association of Hospital Social Workers.

American Proctologic Society.

American Society for Regional Anesthesia.
 American Stomatological Association.
 American Urological Association, New York Society.
 Association of Dental Hygienists.
 Association of Italian Physicians of America.
 Association of Tuberculosis Clinics.
 Associated Out-Patient Clinics.
 Beth Israel Hospital Examinations.
 Children's Welfare Federation.
 Committee on Dispensary Development.
 Cornell Medical Alumni.
 Cosmos Clinical Society.
 Eastern Medical Society of the City of New York.
 Educational and Efficiency Society for Dental Assistants.
 First District Dental Society, General and Sections.
 German Medical Society.
 Good Samaritan Dispensary.
 Loomis Sanatorium.
 Manhattan Dermatological Society.
 Medical Association of the Greater City of New York.
 Medical Society of the County of New York.
 Medical Society of the County of New York, Periodic Health
 Examinations, Lectures and Committee.
 Mental Hygiene Committee Lectures.
 Metropolitan Medical Society.
 National Tuberculosis Association.
 New York Dermatological Society.
 New York Electrotherapeutic Society.
 New York Neurological Society.
 New York Odontological Society.
 New York Pathological Society.
 New York Roentgen Society.
 New York Society of Clinical Psychiatry.
 New York Society of Graduates in Medical Gymnastics and
 Massage.
 New York Society for Thoracic Surgery.
 New York Surgical Society.
 New York Tuberculosis Association.
 New York Veterinary Medical Society.

School Physicians' Advisory Council.
 Society of Medical Jurisprudence.
 Tuberculosis Preventorium for Children.
 Women's Medical Association of New York City.

Accommodations, free of charge, have been granted during the year to:

American Heart Association.
 Biggs Memorial Committee.
 The Harvey Society.
 Medical Board, Montefiore Home and Hospital.
 New York Heart Association.

There was received, other than books, a collection of etchings and engravings, the gift of Dr. Charles L. Dana.

During the year, the following members of the Academy have died:

Francke H. Bosworth	George French Little
William E. Boyce	Edward L'H. McGinnis
Nathan E. Brill	William McKay
E. B. Bronson	T. Halsted Myers
LeRoy Broun	H. Morton Pierson
Earle Conner	William E. Porter
John J. Cotter	Norman H. Probasco
Eden V. Delphey	John P. Reilly
Henry A. Fairbairn	Walter M. Silleck
John A. Fordyce	John Wesley Small
George V. Foster	Frank Steinke
Morris Harold Frantz	William E. Studdiford
Marcus B. Heyman	A. Walter Suiter
Walter B. Johnson (Associate)	George M. Swift
James Law	William B. Trimble

Respectfully submitted,

CHARLES M. WILLIAMS,
Historical Secretary.

REPORT OF THE COMMITTEE ON LIBRARY

The current year terminates the period of forty-five years, during which Mr. John S. Brownne has most ably and enthusiastically fulfilled the duties of Librarian and has promoted the welfare of the Academy in many other ways. On Mr. Brownne's retirement on August 1st, with the title of Consultant Librarian, he was presented with a testimonial of appreciation and esteem by the Fellows of the Academy.

The Committee on Library takes great pleasure in welcoming the new Librarian, Dr. Archibald Malloch, whose term of office will commence on January 1st, 1926. The management of the Library in the meantime rests in the efficient hands of our Acting Librarian, Mrs. L. E. Smith.

In connection with this important change the Committee desires to acknowledge its debt of gratitude to the Director of the Academy, whose careful and efficient canvass of the available candidates for the position has terminated so propitiously.

Among the matters dealt with by the Committee during the current year the following are the most important:

1. Recommendations for the revision of the By-law 13, which relates to the Committee on Library.

2. The revision of the note on donations and bequests, appended to the list of Academy funds in the Constitution and By-laws, so that it shall define specifically the requirements for establishing special library funds.

3. The revision of the rules and regulations of the Library.

4. The provision against destruction of the Library Accession Catalogue by fire by depositing all volumes but the one now in use, in a fire-proof vault outside the Academy building. It was also recommended that future accession books should be made in duplicate, one copy to be outside the building. The back volumes of the Library Accession Catalogue are now in the vaults of the Guaranty Trust Company.

5. The recommendation that the revision of the shelf catalogue, discontinued two years ago, should be left in abeyance until the new Librarian shall take active charge.

6. The continued need of more stack room, which has been referred to in several of the previous annual reports, has been pro-

vided for by the enclosure of some of the book shelves in Du Bois Hall, and by a further increase in the shelf space in the Main Reading Room.

7. The provision of bibliographic and other forms of library service on an extended scale has formed the subject of several discussions and enquiries. The Committee is not yet in a position to make recommendations.

The Committee is much concerned, as heretofore, with the difficulty in detecting pilferers and defacers of library books. Expenses on this score are perhaps not greater than usual, but certainly are not less.

The experiment will be tried of placing new books on exhibition in the stack room, which is accessible only to Fellows.

LIBRARY FINANCE

In previous reports it has been necessary to offer some explanation of increasingly large expenditures for the maintenance of the Library and for the salaries of the staff as compared with the income of the special Library funds. The Library, in fact, has been hampered by the existence of funds theoretically sufficient, but actually inadequate to meet the general Library expenses. Owing to the enlightened policy, inaugurated this year, of budgeting the Library expenses without reference to the existing funds now inadequate to meet them, such explanations are no longer necessary.

The change of the termination of the fiscal year from October 31 to December 31, has necessitated the inclusion of fourteen months in the expenditures for the current year, less the few days of December still unaccounted for.

1925

<i>Budget</i>		<i>Expenditures</i>	
Subscriptions	\$ 7,000.00	Subscriptions	\$ 6,814.38
Completing Files	500.00	Completing Files	673.37
Binding, Current	4,500.00	Binding, Current	4,555.75
Binding, Back	2,400.00	Binding, Back	2,560.75
New Books	5,000.00	New Books	4,165.72
Supplies and Sundries	175.00		
		Total	\$18,769.97
Total	\$19,575.00	Balance	\$05.03

This budget does not include salaries.

1926

The following budget is submitted as representing the needs for the coming year:

Subscriptions	\$ 6,500.00
Completing Files	1,000.00
Binding, Current	4,500.00
Binding, Back	2,000.00
New Books	5,000.00
	<hr/>
	\$19,000.00

STATISTICAL REPORT

The following donors gave more than twenty books each:

Dr. S. T. Armstrong	32	Dr. Edward I. Kellogg	31
Dr. W. Ackerman	150	Dr. Lavinder	95
Mrs. Clinton Bagg	62	Lincoln Hospital	467
Dr. Bancroft	36	Dr. Emil Meyer	91
Dr. S. S. Barnett	20	Dr. Henry Mooney	88
Dr. E. Beer	28	Drs. J. A. and F. R. McCreery	75
Dr. Robert Carlisle	30	Dr. Alfred Meyer	37
Dr. H. S. Carter	28	Dr. J. B. McMahon	253
Dr. A. S. Currier	157	Dr. Harold Neuhof	178
Dr. Charles N. Dowd	38	N. Y. City Dept. of Health	22
Dr. Dennett	34	Post Graduate Hospital	61
Mrs. Henry Dessau	236	Rockefeller Foundation	48
Dr. Charles L. Dana	29	Dr. Dudley Roberts	35
Dr. Louis Fischer	37	Dr. A. Reich	61
Dr. Fulton	40	Rockefeller Institute	50
First District Dental Society	38	Major L. L. Seaman	20
Dr. Edgar H. Farr	211	Dr. Ira O. Tracy	50
Mrs. Gustav Grant Fisch	552	Dr. Allen M. Thomas	258
Dr. R. G. Freeman	24	Dr. W. T. Thomas	94
Dr. Rowland G. Freeman	120	Dr. Karl Vogel	32
Dr. H. R. A. Graeser	125	Dr. H. M. Vineberg	267
Dr. R. A. Hurd	20	Dr. Charles M. Williams	66
Dr. A. Herzfeld	43	Dr. George G. Ward	24
Dr. M. S. Kakels	20	Dr. N. B. Waller	139

According to their custom the following publishing houses have kindly donated volumes from their presses:

D. Appleton and Company	34	Paul B. Hoeber, Inc.	10
Chemical Catalogue Company	2	Lea and Febiger	27
Dental Items of Interest	3	H. K. Lewis Company	1
F. A. Davis Company	7	G. P. Putnam's Sons	1
H. G. Fischer and Company	2	W. B. Saunders Company	57
Funk and Wagnalls	3	William Wood and Company	9

A. *Books.*

Books accessioned from November 1, 1924, to December 18, 1925, inclusive	5,135
Books and periodicals bought and accessioned.....	3,163
Books and journals donated by publishers.....	240
Books donated by members and societies.....	1,732

A2. Total number of books accessioned (not including duplicates)

December 18, 1925.....	139,320
Number of pamphlets accessioned.....	98,685
Pamphlets catalogued and accessioned during year.....	3,756

We are now receiving regularly periodicals as follows:

American	530	Italian	103
British	193	Spanish	83
French	178	Other languages	78
German	346		
		Total	1,511

B. *Circulating Department.*

1919	3,192 books and pamphlets, (2,336 books) (856 pamphlets)	1,825 journals, issued 2,677 times to 556 members, publishers and other libraries.
1920	4,191 books and pamphlets, (3,081 books) (1,110 pamphlets)	2,264 journals, issued 3,455 times to 634 members, publishers and other libraries.
1921	4,527 books and pamphlets, (3,311 books) (1,216 pamphlets)	3,105 journals, issued 4,170 times to 677 members, publishers and other libraries.
1922	4,284 books and pamphlets, (3,350 books) (934 pamphlets)	2,955 journals, issued 3,961 times to 689 members, publishers and other libraries.
1923	4,175 books and pamphlets, (3,197 books) (978 pamphlets)	3,172 journals, issued 3,885 times to 696 members, publishers and other libraries.
1924	4,432 books and pamphlets, (3,302 books) (1,130 pamphlets)	3,681 journals, issued 4,293 times to 720 members, publishers and other libraries.
1925	4,500 books and pamphlets, (3,181 books) (1,319 pamphlets)	3,708 journals, issued 4,342 times to 713 members, publishers and other libraries.

C. *Reading Room.*

1919	23,500
1920	27,475
1921	34,290
1922	31,160
1923	29,700
1924	27,400
1925	33,425

Holiday and Sunday Readers

1919	620
1920	776
1921	768
1922	541
1923	526
1924	587
1925	708

D. *Bookbinding.*

Total numbers of volumes bound	3,150
Cost of such binding	\$7,116.50

E. *Finance.*

Bookbinding, current volumes	\$ 4,555.75
Bookbinding, back volumes	2,560.75
Completing Files	673.37
Subscriptions	6,814.38
New Books	4,165.72
Total	\$18,769.97
Expenses	\$18,769.97
Salaries	17,709.04
Union Check List	1,800.00
Total	\$38,278.01

F. *Growth of the Library.*

The additions to the Library, which have been accessioned since 1918 during the last eight years, are as follows, exclusive of duplicates:

1918	2,697	volumes and	3,794	pamphlets
1919	2,468	"	4,355	"
1920	4,614	"	615	"
1921	5,000	"	2,259	"
1922	2,976	"	4,389	"
1923	4,416	"	5,739	"
1924	3,362	"	6,422	"
1925	5,135	"	3,756	"

246,000 cards have been used for the catalogues.

Since the last report there have been 756 cards issued for the use of the Library during afternoons and evenings.

There are 26 annual Library subscribers registered in 1925.

Respectfully submitted,

H. D. SENIOR,
Chairman.

REPORT OF THE COMMITTEE ON ADMISSION

Your Committee begs leave to submit a statistical report as follows:

Number of candidates recommended for election:

To Fellowship	47
To Associate Fellowship.....	8
Waiting List December 31st.....	120

Five reinstatements were recommended during the year and one refused.

The circular letter issued in the Spring calling the attention of Fellows of the Academy to the long waiting list of candidates and suggesting some standards for the selection of new Fellows brought most encouraging responses.

With the new form of application blank, which went into effect in November, your Committee feels that its facilities for the investigation of candidates are much improved, and that its selections will be made more rapidly than has been possible in the past.

Respectfully submitted,

NELLIS B. FOSTER,
Chairman.

ABSTRACT OF REPORT ON THE ACTIVITIES OF THE
PUBLIC HEALTH COMMITTEE OF THE NEW YORK
ACADEMY OF MEDICINE FOR THE YEAR 1925

During 1925, a large number of very important matters came before the Public Health Committee. The work accomplished falls into five main divisions:

1. Problems of City Health and Hospital Organization.
2. Surveys and Investigations.
3. Improvements in Health Environment and Health Control.
4. Legislation.
5. Co-operative Activities.

I

PROBLEMS OF CITY HEALTH AND HOSPITAL ORGANIZATION

Consolidation of Municipal Hospitals.

After conferences with the Mayor and the Commissioner of Public Welfare, a plan has been worked out for the consolidation of the municipal non-contagious disease hospitals, whereby the control of medical, surgical, scientific and educational policies is to be vested in a board appointed by the Mayor from among representatives of the Academy of Medicine, the five medical societies, and the medical schools of the City. The plan in the form of a tentative bill was introduced by Mr. Hylan in the Municipal Assembly on December 11, 1925, but no action was taken. It served to give widespread publicity to the measure, and various suggestions for changes and amendments have been offered. On December 28th, the Executive Committee of the Public Health Committee held a conference with official representatives of the County Medical Societies of this City at which the various provisions of the bill were discussed.

Plans for the Development of Welfare Island (Blackwell's Island).

The Committee held several conferences on the future utilization of Welfare Island. It was the Committee's opinion that the Island should be utilized for both hospital and recreational purposes. Two large hospitals for the care of chronic and convalescent patients would probably meet the needs of these two groups, while the Almshouse could be consolidated with the Farm Colony on Staten Island. It is the belief of the Committee that the penal institutions should be removed from the island, and the space thus gained utilized for recreational purposes. Owing to differences of opinion as to the future use of the Island and its accessibility, the Committee suggested that the incoming administration appoint a commission of engineers, physicians, and city planners to study the situation in a thorough-going manner.

Health Problems of the City.

The committee has prepared an outline of the principal problems in the fields of public health and hospitalization. This outline is to be presented to the new administration.

Health Department Organization.

Considerable thought has been given to the present organization of the Department of Health. It is the Committee's belief that considerable re-organization should be effected in the interest of efficiency.

The Lincoln Hospital Budget.

It was largely due to the advice of the Public Health Committee that the Lincoln Hospital was taken over by the City. It therefore particularly devolved upon the Committee to inquire into the proposed budget of the hospital after it came under the jurisdiction of the Department of Public Welfare and to make suggestions to the Commissioner.

The Commissionership of Health.

The Mayor-elect requested the Committee to advise with reference to the qualifications of the men who have been proposed to him for the office of Health Commissioner, and the Committee complied with this request.

II

SURVEYS AND INVESTIGATIONS

The Nursing Situation.

In view of the pronounced shortage of nurses, the Committee held several conferences with representatives of the State Education Department, the hospital authorities, and medical organizations, with a view of changing certain aspects of the existing law and its administration as well as altering the fundamental basis for the training of nurses. The need for more ample facilities for training of nurse attendants as well as of special training of tuberculosis nurses has been emphasized.

Religious Healing.

The Committee felt that the extent and character of religious healing should be ascertained with a view of assisting the clergy in directing this movement into proper channels. A special investigator is at work collecting the data.

Care of Crippled Children.

At the request of the Association for the Aid of Crippled Children, the Committee undertook a study of the results obtained from the social service work with crippled children, which is carried on by the Association.

Convalescent Care.

The lack of co-ordination in the field of convalescent care has led to a study of the situation and to the organization of a convalescence service for the guidance of both the convalescent homes and hospitals as well as of the medical profession and the public in general. Standards for the proper handling of medical, surgical, neurological and pediatric patients have been formulated and published.

Tetra-ethyl Lead.

The occurrence of several cases of severe poisoning from tetra-ethyl lead in connection with its manufacture prompted an inquiry into the situation. The Committee also took part in a conference on the subject in Washington, which was called by the Surgeon General of the Public Health Service.

Carbon Monoxid.

Carbon monoxid poisoning, particularly in relation to automobile exhaust gas, has received study throughout the year. The literature on the subject has been studied, and a report on all available data with regard to the clinical and physiological phases of the subject has been prepared. The need for further studies, particularly on the physiology of carbon monoxid poisoning, has been emphasized.

Standards of Physical Fitness of Teachers.

At the request of the School Survey of the Department of Education, the Committee prepared a report on the standards of physical fitness for teachers. The report was submitted to the Board of Education.

Population Control Clinic.

Some of the problems of birth control clinics came before the Committee, and a statement was prepared concerning the conditions under which a clinic of this character should be conducted.

III

IMPROVEMENTS IN HEALTH ENVIRONMENT AND
HEALTH CONTROL*Ventilation of School Classrooms.*

Notwithstanding the fact that the findings of the New York State Ventilation Commission demonstrated ventilation through open windows is much more practicable and beneficial than by artificial means, no steps have been taken to abandon fan ventilation in the schools. Although no law of this State and most other states makes artificial ventilation mandatory, the City of New York under its home rule is not bound by such a law. The requirements of the Board of Education, however, call for this type of ventilation. The Committee hopes to influence the Board of Education to change its attitude on the question of ventilation.

Mental Health.

In connection with the movement for a wider extension of mental health work among children, the Committee has discussed the need of further inquiry into the relation between the physical and the mental growth of children, and of a more discriminating attitude concerning the value of applying intelligence tests to children; and also of a better understanding of the methods of imparting health education without developing fear phychoses.

Communicable Diseases of the Nervous System.

In view of the baffling nature of some of the diseases of the central nervous system, the Committee organized jointly with the Department of Health a Commission for the study of the etiology, pathology, and epidemiology of encephalitis lethargica, poliomyelitis and meningococcus meningitis.

Whooping Cough.

In view of the inadequate control of whooping cough, which stands as the third highest cause of death among the acute infectious diseases, the Committee has been requested by the Department of Health to make a study of the problem from the point of view of administrative control.

Venereal Diseases.

The matter of control of venereal diseases through better enforcement of the police powers of the Department of Health is a subject which has received a great deal of consideration by the Committee. A special sub-committee is at work on the problem.

Gonorrheal Vaginitis.

At the request of a group of hospital social service workers, the Committee has taken up the question of the prevention, treatment, and institutional management of cases of gonorrheal vaginitis in children. The matter is in the hands of a special sub-committee.

X-ray Treatment of Hypertrichosis.

The Section of Dermatology of the Academy called the attention of the Committee to the danger of treatment of hypertrichosis by X-rays, and particularly when it is given without medical supervision in the so-called "beauty parlors." There are cases on record when the treatment resulted in malignancy. The matter was submitted to the Health Department and was given publicity through the daily press.

Stillbirths.

The Surgeon General of the United States Public Health Service submitted to the Committee a report on the definition of a stillbirth, which a special committee of the Health Section of the League of Nations has proposed for adoption by all countries. The definition proposes the substitution of the word "dead-birth" for stillbirth and as criteria of a deadbirth—the absence of respiratory breathing in a foetus of 28 weeks of utero-gestation, and a minimum body length of the foetus of 35 centimeters. The Committee endorsed this definition, but in view of the fact that in many countries a large percentage of the births are attended by midwives, it was thought for the sake of simplicity that the "28 weeks of pregnancy" should be omitted, and the definition based entirely on objective and readily ascertainable criteria such as the absence of respiratory breathing and the body length of the foetus. The change of name from stillbirth to deadbirth was endorsed.

IV

LEGISLATION

Autopsies.

It was through the efforts of the Committee that the law pertaining to cadavers, which has been on the statute books since 1832, was finally amended to meet the requirements of modern medicine.

Chiropractors.

The Committee expressed its unqualified disapproval of allowing chiropractors to obtain legal right to practice in this State. The Committee believes that in the interest of public health no one who has not graduated in medicine should be allowed to practice.

Marriage Laws in relation to Minors.

The proposed legislation on the part of the New York State Commission to Examine Laws relating to Child Welfare received consideration by the Committee, particularly in its sociological and eugenic aspects.

V

CO-OPERATIVE ACTIVITIES

Supervision of Radio Health Talks.

In conjunction with the New York Tuberculosis Association, the Committee advised the authorities of several of the broadcasting stations with regard to the suitability of papers dealing with health and medical matters. The Committee was able to forestall the broadcasting of some papers of a commercial or misleading nature.

Popular Lectures.

The Committee was joint sponsor with the New York Tuberculosis and Health Association for a series of lectures on popular health subjects carried on under the auspices of the East Harlem Health Center.

Municipal Civil Service Commission.

The Committee co-operated with the Municipal Civil Service Commission in selecting medical examiners of candidates for various positions in the City medical service, and also in establishing the basis for rating.

Child Health Day.

The Committee co-operated with the Department of Health in organizing a meeting at the Academy on Child Health Day (May 1st) in order to impress upon physicians the importance of health examinations of children.

There were numerous minor matters on which the opinion of the Committee was requested and given.

REPORT OF THE COMMITTEE ON MEDICAL EDUCATION

During the year the activities of the committee have been carried on with the aid of Dr. Frederick P. Reynolds, Medical Secretary; Miss Grace Carstensen, Executive Secretary; Miss Mary Felter in charge of the daily Surgical Bulletin, and a part-time assistant to mimeograph, address and mail the bulletins.

A Bureau of Clinical Information has been conducted on the entrance floor of the Academy building. Bulletins of surgical and medical clinics have been issued and, when necessary, these clinics have been organized and supervised.

An extensive study of New York's medical and surgical graduate educational facilities has been made and bulletins have been issued which describe these facilities in detail.

A descriptive pamphlet of hospital organizations, so far as it bears on medical and surgical education, is in the process of preparation.

A detailed description of these activities follows:

Bureau of Clinical Information. The increased usefulness of this bureau is evident. Its facilities are more widely understood and visiting physicians now apply there in large numbers.

During the year 1925 the bureau has published the *Daily Bulletin of Surgical Clinics* without interruption. Because of the increased size of the bulletin, the posting of certain operations of little educational value was discontinued. This has resulted in an improvement in the quality of the programs and has shortened the programs by about one quarter. The daily average is:

Number of hospitals reporting	29
Number of operations	133
Number of surgeons	78

There are 281 paid subscribers to the surgical bulletin, and the bureau mails from twelve to twenty each day to physicians and surgeons who are temporarily in the city.

In May, 1925, the plan of publishing in the "Medical Week" the *Weekly Bulletin of Medical Clinics* was inaugurated, at a considerable saving both of time and money. Twenty-three hospitals are now posting regularly in the weekly bulletin, as follows:

Daily	1
More than once a week	9
Weekly	7
Fortnightly	6

A list of hospitals which post operations and clinics is hereto appended. It will be noticed that almost all of the general hospitals and the important special hospitals which have met the minimum standards of the American College of Surgeons now post operations in the surgical bulletin.

Paid advertisements announcing the facilities offered by the Bureau of Clinical Information have been carried in the *Journal of the American Medical Association*, the *Journal of the Canadian Medical Association* and in the *American Journal of Medical Sciences*.

Announcements of the activities of the Committee have also been published in many of the leading medical journals of the country, including the *Journal of the American Medical Association* and its Spanish edition. Following these advertisements and announcements, there has been a definite increase in the number of inquiries by mail, and in the number of visitors at the bureau.

During the year 520 guests have registered at the bureau in addition to 62 who visited the desk at the meeting of the Clinical Congress of Surgeons in Philadelphia. These visitors came from all but two states of the Union (New Mexico and Idaho), and from Porto Rico and Hawaii; from Iceland; from eight Canadian provinces and eleven Latin American countries; from fifteen countries of Europe, six of Asia, from South Africa, Australia and New Zealand.

The Committee has been represented by the Medical Secretary and the Executive Secretary at the meetings of a number of medical societies which have been held in New York and its vicinity. At these meetings, copies of synopses, announcements, bulletins and other printed information regarding opportunities for graduate study in New York and other cities were kept at hand and were frequently asked for.

Synopses of opportunities in New York for Graduate Study. Sub-committees have investigated and reported upon courses and other opportunities offered in New York City for graduate study in the clinical specialties. Based upon these reports separate synopses have been prepared and published which describe in detail the opportunities for graduate study in ophthalmology, oto-laryngology, medicine, surgery, urology, obstetrics and gynecology, dermatology and syphilology, and pediatrics. A synopsis on orthopedic and rehabilitation surgery is in press and one on neuropsychiatry is in course of preparation. A sub-committee is expected soon to report upon the opportunities offered for graduate study in radiology. There has also been prepared and published a synopsis of opportunities for graduate study in the pre-clinical or fundamental medical science subjects.

Copies of the synopses already printed have been sent to a mailing list of about 650 names, including medical societies, libraries, journals and hospitals, and other organizations and individuals interested in medical education.

Hospital Survey. Your committee appreciates that the interne services in our hospitals offer very important educational opportunities to those who obtain suitable appointments from the hospital authorities; also that in addition to the ordinary interne services, there are some opportunities for appointments as resident physicians or surgeons which are open to those who have

had previous interne experience. Also that there are many special hospitals which offer internships in specialties to candidates who have had previous interne experience. And there are some available fellowships and there are various opportunities for positions as assistants in out-patient departments.

A careful survey of such opportunities is being made. It is planned to publish the information thus obtained in the form of a booklet.

Respectfully submitted,
CHARLES N. DOWD,
Chairman.

LIST OF HOSPITALS NOW POSTING IN THE DAILY SURGICAL
BULLETIN

New York Hospitals

Beekman Street	Manhattan Eye, Ear & Throat
Bellevue	Memorial
Beth David	Metropolitan
Beth Israel	Montefiore
Broad Street	Misericordia
Bronx	Mount Sinai
City	Neurological Institute
Columbus	New York
Fifth Avenue	New York Eye and Ear In-
Flower	firmary
Fordham	New York Orthopedic
French	New York Polyclinic
Gouveneur	Nursery and Childs
Harlem	Peoples
Hospital for Joint Diseases	Post Graduate
Hospital for Ruptured and	Presbyterian
Crippled	Reconstruction
Italian	Roosevelt
Jewish Memorial	St. Bartholomew
Knickerbocker	St. Francis
Lebanon	St. Luke's
Lenox Hill	St. Mark's
Lexington	St. Mary's Free Hospital for
Lincoln	Children
Lutheran of Manhattan	St. Vincent's

Veterans' No. 81

Woman's

Skin and Cancer

U. S. Marine No. 70

Brooklyn Hospitals

Beth Moses

Brooklyn

Brownsville and East N. Y.

Bushwick

Coney Island

Cumberland Street

Greenpoint

Harbor

Holy Family

Jewish

Kings County

Long Island College

Methodist Episcopal

Norwegian

Peck Memorial

Prospect Heights

St. Catherine's

St. John's

St. Mary's

St. Peter's

Swedish

United Israel Zion

Wyckoff Heights

United States Naval Hospital

Staten Island

St. Vincent's

HOSPITALS POSTING IN THE WEEKLY BULLETIN OF MEDICAL
CLINICS*Hospitals posting once a month*

None

Hospitals posting twice a month

St. Vincent's

Brooklyn

Brooklyn Jewish

Riverside

Greenpoint

Babies' (P. and S.)

Hospitals posting once a week

Harlem

Lincoln

New York

Presbyterian

Montefiore

Lenox Hill

Rehabilitation Institute

(Vanderbilt Clinic posts weekly, alternating with Babies' and Bellevue)

Hospitals posting more than once a week

Post Graduate

Bellevue

Beth Israel

Beth Moses

Beth David

Polyclinic

Central Neurological

City

University and Bellevue Clinic

REPORT OF THE BUILDING COMMITTEE

The Building Committee reports that they have held eighteen meetings during the year. The preliminary drawings submitted by York and Sawyer under date of December 15, 1924, were approved by the Building Committee and the Council of the Academy. The drawings for the facade were finally accepted later, after criticism and suggestion from the Art Committee.

Marc Eidlitz & Son were selected as contractors at a maximum price of \$1,406,061.

Preparation of the plans was rushed as soon as the announcement was made that the Carnegie Corporation had approved an additional \$550,000 at its January meeting.

The site of the new building was taken over by the contractors at the end of March and work was begun the second week in May. There was considerable difficulty with the foundation and the cost proved to be approximately \$45,000 more than had been anticipated. As the work has progressed, the architect and the contractor have each made suggestions for diminishing the cost and savings have been made so that the budget which was drawn up by Marc Eidlitz & Son, amounting to \$1,406,061 and approved by the committee on June 2, has been adhered to.

The Building Committee has authorized the employment of the Barnet Phillips Company for the installation of furniture and fixtures which will cost in the neighborhood of \$115,000.

The Committee has studied in great detail the type of seats to be used and the equipment of section rooms and believes that the Fellows of the Academy will be entirely satisfied with the arrangements which will be made. The seats will be as comfortable as those found in the best theaters and in the auditorium they will be somewhat wider than is usually found in theaters.

The arrangements of the section rooms are such that it will be possible to use moving pictures, lantern, or projectoscope to affix charts to the wall readily, for the proper display of X-ray pictures, for the examination of patients in examining rooms or for the presentation of patients in the section rooms.

A suitable machine for the announcement of Fellows wanted at the telephone will be installed which will be noiseless and can be seen when the room is darkened.

Careful study of the library facilities has been made by the Committee and a great deal of thought given to the question of the stack. This has finally been determined upon to the satisfaction of the library staff and the Committee.

A special study of the possibility of burning oil or coal was made with the decision that coal should be used on account of its economy although the boilers are being installed so that they can be changed to oil-burning if at any time it is believed to be cheaper or necessary.

Payments to the architect have been approved in accordance with the authority given by the Academy to the amount of \$68,027.70 and payments to the contractor have been made amounting to \$448,470.74 and sub-contracts amounting to \$958,540.04 have been let.

The exact date of the opening of the new building cannot as yet be determined but unless there are unforeseen delays the building should be ready for occupancy before the end of the year 1926.

ARTHUR B. DUEL,
Chairman.

HOSACK BED FOR SICK AND NEEDY PHYSICIANS

Attention is directed to the following extract from the will of Mrs. Celine B. Hosack:

"I do give and bequeath unto my executors, hereinafter named, the sum of Ten Thousand Dollars, in trust, to apply and pay the same (or so much thereof as may be necessary) to The Roosevelt Hospital in the city of New York, to purchase a bed which, in memory of my husband, shall be known as the Hosack Bed, and which shall be occupied from time to time by such sick and needy physicians as may for that purpose be named or designated by the President and Treasurer for the time being of The New York Academy of Medicine."

TRUST FUNDS OF THE NEW YORK ACADEMY
OF MEDICINE

Library Funds for the General Purposes of the Library:

THE LIBRARY FUND

Formed by gifts and from sales. Established in
1878 \$ 41,606.75

HORACE PUTNAM FARNHAM, M.D.,
LIBRARY FUND

Gift of Mrs. Eliza C. Farnham, in memory of her
husband, the late Horace P. Farnham, M.D.,
former Vice-President of the Academy. Estab-
lished in 1889 10,000.00

J. MARION SIMS MEMORIAL
LIBRARY FUND

Gift of the Sims Monument Committee as a me-
morial of the late James Marion Sims, M.D.
Established in 1896 100.00

JAMES S. CUSHMAN LIBRARY FUND

Gift of William F. Cushman, M.D., late Treasurer
for the Trustees, as a memorial of his brother.
Established in 1897 1,000.00

DR. ORVILLE RANNEY FLOWER LIBRARY FUND

Gift of the late Governor Roswell P. Flower, as a memorial of his uncle Orville Ranney, M.D. Established in 1897	1,000.00
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ANNA WOERISHOFFER LIBRARY FUND

Gift of Mrs. Anna Woerishoffer, established by the Academy as a special library fund in recognition of many generous contributions. Established in 1897	15,000.00
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WILLIAM T. LUSK MEMORIAL LIBRARY FUND

Established by legacy, and gift of the children of the late Dr. William T. Lusk. Established in 1898	1,000.00
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SEMI-CENTENNIAL LIBRARY FUND

Established by the Semi-Centennial Celebration Committee, December 13, 1898	500.00
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GERMAN HOSPITAL AND DISPENSARY
LIBRARY FUND

Gift from the Collegium of the Physicians of the German Hospital and Dispensary. Established December 3, 1903	3,076.90
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ALBERT WILLIAM WARDEN MEMORIAL
LIBRARY FUND

Legacy of Albert William Warden, M.D. Estab- lished December 15, 1906	950.00
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LONDON CARTER GRAY MEMORIAL LIBRARY FUND

Legacy of Landon Carter Gray, M.D. Established in 1911	46,596.05
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RUDOLPH A. WITTHAUS, M.D., LIBRARY FUND

Legacy of Rudolph A. Witthaus, M.D. Established in 1917. Principal not yet in the hands of the Trustees, but will probably be about	120,000.00
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Library Funds restricted for the purchase of books:

DR. EVERETT HERRICK LIBRARY FUND

Legacy of Everett Herrick, M.D. Established in 1915	25,000.00
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PHILIPPINE MEYER AND ERNST JACOBI
LIBRARY FUND

Gift of Mr. Jacob Meyer and Dr. A. Jacobi. In- come to be used for the purchase of books. Established in 1887	14,486.00
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MERRILL WHITNEY WILLIAMS LIBRARY FUND

Gift of Mrs. Robert M. Gallaway as a memorial of her father. Income to be used for the pur- chase of books. Established in 1895	220.00
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ERNST KRACKOWIZER LIBRARY FUND

Gift of friends of the late Ernst Krackowizer, M.D. Income to be used for the purchase of books. Established as a library fund in 1897, was originally a prize fund	1,798.05
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AUSTIN FLINT, M.D., LL.D., MEMORIAL
LIBRARY FUND

Established by certain alumni of the Bellevue Hospital Medical College, and friends of the late Austin Flint, M.D., LL.D. Income to be used for the purchase of books. Established July 2, 1910	1,200.00
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*Library funds restricted for the purchase of
special books:*

THE BULLOWA MEMORIAL LIBRARY FUND

Gift of Jesse G. M. Bullova, M.D., and others, in memory of their brother, Ferdinand E. M. Bullova. Income to be used for the purchase of books relating to the ductless glands. Estab- lished in 1919	754.40
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A. L. NORTHROP, D.D.S., DENTAL LIBRARY FUND	
Gift of First District Dental Society, N. Y. Income to be used for the purchase, binding and care of books upon Dentistry. Established in 1897.....	250.00

DR. JAMES P. TUTTLE LIBRARY FUND

Legacy of James P. Tuttle, M.D. Income to be used for the purchase of books on Diseases of the Digestive Tract. Established in 1913	1,000.00
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Funds restricted to Special Uses:

WESLEY M. CARPENTER LECTURESHIP FUND

Legacy of Wesley M. Carpenter, M.D. Income to be used annually for one medical lecture. Established in 1891	5,813.09
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EDWARD N. GIBBS MEMORIAL PRIZE FUND

Gift of Mrs. Edward N. Gibbs and Miss George Barker Gibbs (now Mrs. Charles H. Sherrill). Income to be awarded to a research worker on Diseases of the Kidney. Established in 1901.....	17,439.33
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ALFRED LEE LOOMIS ENTERTAINMENT FUND

Legacy of Alfred Lee Loomis, M.D., Ex-President of the Academy. Income to provide refreshments after meetings of the Academy. Established in 1895	10,000.00
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Unrestricted General Funds:

ENDOWMENT FUND

Formed by the admission fees of the Fellows and by any special donations or bequests that may be received for the fund. The income shall be expended, as necessary, for the construction, betterment or maintenance of the Academy. Established October 19, 1905	41,202.46
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GENERAL PERMANENT FUND

Formed by all gifts to The New York Academy of Medicine not otherwise specifically designated by donors. (Includes the legacies of Alexander B. Hosack, \$70,000.00, Everett Herrick, \$25,000.00, and Ramon Guiteras, \$4,911.80.) Income to be used for the purpose of advancing medical science under the direction of the Trustees.....	657,059.45
Total of Trust Funds	\$1,017,052.48

DONATIONS TO THE LIBRARY FUNDS

Donations and bequests are solicited by The New York Academy of Medicine for the maintenance and expansion of the Library.

A donation or bequest of \$5,000 or more will provide for a special library fund, the income of which may be used for the general purposes of the Library or restricted to the purchase of books and periodicals, as the donor or testator may indicate.

FORM OF BEQUESTS

The following is a brief legal form as a suggestion under which bequests may be made in behalf of the Academy:

I give, devise and bequeath unto "The New York Academy of Medicine" of the City of New York, State of New York, a corporation duly incorporated by the Legislature of the State of New York by an act, entitled "An act to incorporate The New York Academy of Medicine," passed June 23, 1851, and amended June 4, 1853, and June 2, 1877

DATES OF MEETINGS

Stated Meetings of the Academy, 1st and 3rd Thursdays.

Trustees, 2nd Wednesday.

Council, 4th Wednesday.

Committee on Library, 2nd Tuesday.

Committee on Admission, 1st Wednesday.

Public Health Committee, Mondays.
 Committee on Medical Education, 3rd Wednesday.
 Building Committee, 1st and 3rd Tuesdays.
 Publication Committee, date varies.
 Program Committee, date varies.

DATES OF SECTION MEETINGS

Dermatology and Syphilis, 1st Tuesday.
 Surgery, 1st Friday.
 Neurology and Psychiatry, 2nd Tuesday.
 Pediatrics, 2nd Thursday.
 Otology, 2nd Friday.
 Ophthalmology, 3rd Monday.
 Medicine, 3rd Tuesday.
 Genito Urinary Surgery, 3rd Wednesday.
 Orthopedic Surgery, 3rd Friday.
 Obstetrics and Gynecology, 4th Tuesday.
 Laryngology and Rhinology, 4th Wednesday.
 Historical and Cultural Medicine, date varies.

FELLOWS OF THE NEW YORK ACADEMY OF MEDICINE RESIDING IN NEW YORK CITY

1883	Abbe, Robert	1907	Albee, Fred H.
1913	Abbott, Theodore J.	1918	Alexander, Lawrence
1901	Abraham, Joseph H.		D., Jr.
1910	Abrahamson, Isador	1905	Alger, Ellice M.
1917	Abramowitz, E. William	1920	Allen, Frederick M.
1921	Adair, Frank Earl	1881	Allen, Thomas H.
1889	Adams, Calvin Thayer	1921	Altman, Emil
1901	Adams, Charles F.	1915	Ames, Thaddeus H.
1905	Adams, Warren S.	1915	Amey, J. Willis
1916	Addoms, Lewis P.	1918	Amster, J. Lewis
1909	Agatston, Sigmund A.	1918	Anderton, Walter P.
1908	Aitken, James Francis	1924	Andresen, Albert F. R.

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|------|----------------------------|------|-----------------------------|
| 1923 | Andrews, George C. | 1906 | Barringer, Theodore B., Jr. |
| 1909 | Aranow, Harry | 1924 | Barrows, David Nye |
| 1918 | Armstrong, Arthur S. | 1913 | Barshell, Samuel |
| 1924 | Armstrong, Donald B. | 1909 | Bartlett, Frederic H. |
| 1922 | Armstrong, Edgar B. | 1905 | Bartley, Elias Hudson |
| 1917 | Armstrong, Edward McP. | 1889 | Barton, Joshua L. |
| 1889 | Aronson, Moses | 1899 | Baruch, Herman B. |
| 1906 | Arrowsmith, Hubert | 1909 | Basch, Seymour |
| 1913 | Asch, Joseph Jefferson | 1913 | Bass, Murray H. |
| 1919 | Aschner, Paul W. | 1908 | Bassler, Anthony |
| 1900 | Ashley, Dexter D. | 1914 | Bastedo, Walter A. |
| 1896 | Aspell, John | 1914 | Baughman, William H. |
| 1921 | Atkins, Richard T. | 1919 | Bauman, Louis |
| 1919 | Atonna, Carmelo | 1920 | Beach, Bennett S. |
| 1906 | Atwood, Charles E. | 1918 | Bebb, Rose Anne |
| 1910 | Auchincloss, Hugh | 1912 | Bechet, Paul E. |
| 1912 | Auerbach, Julius | 1921 | Beck, Alfred Charles |
| 1909 | Avery, Oswald T. | 1911 | Beekman, Fenwick |
| 1918 | Babcock, James W. | 1905 | Beer, Edwin |
| 1918 | Baehr, George | 1906 | Begg, Colin L. |
| 1916 | Bailey, Cameron V. | 1897 | Belcher-Hardy, Sarah D. |
| 1911 | Bailey, Harold C. | 1923 | Bell, Alfred Lee Loomis |
| 1901 | Bainbridge, William Seaman | 1904 | Bell, George H. |
| 1918 | Bainton, Joseph H. | 1925 | Bell, Samuel Dennis |
| 1921 | Baketel, H. Sheridan | 1918 | Beller, Abraham J. |
| 1924 | Bakwin, Harry | 1916 | Berens, Conrad |
| 1900 | Baldwin, Helen | 1900 | Berg, Albert A. |
| 1907 | Ballin, Milton J. | 1890 | Berg, Henry W. |
| 1914 | Bancroft, Frederic W. | 1923 | Bergamini, Herbert M. |
| 1914 | Bandler, Clarence G. | 1902 | Berkeley, William N. |
| 1901 | Bandler, Samuel W. | 1923 | Berne, Luis P. |
| 1908 | Bang, Richard T. | 1924 | Bernstein, Max |
| 1924 | Banowitch, Morris M. | 1917 | Berry, Charles White |
| 1914 | Barber, W. Howard | 1925 | Berry, Frank B. |
| 1908 | Barringer, Benjamin S. | 1920 | Bibby, Henry L. |
| 1908 | Barringer, Emily Dunning | 1901 | Bierhoff, Frederic |
| | | 1895 | Biggs, George P. |

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|------|-----------------------|------|------------------------|
| 1903 | Billings, John S. | 1917 | Brennan, Robert E. |
| 1920 | Bingham, Anne Tefft | 1918 | Brenner, Edward C. |
| 1913 | Bishop, Ernest S. | 1919 | Brenner, Isidore M. |
| 1893 | Bishop, Louis F. | 1924 | Brennglass, Joachim |
| 1903 | Bissell, Dougal | 1897 | Brettauer, Joseph |
| 1915 | Black, Florence A. | 1889 | Brewer, George E. |
| 1910 | Blackwell, Hugh B. | 1905 | Brickner, Walter M. |
| 1895 | Blake, Joseph A. | 1912 | Brill, Abraham A. |
| 1924 | Blancard, William | 1914 | Broder, Charles B. |
| 1910 | Blank, Marcus I. | 1904 | Brodhead, George L. |
| 1919 | Blatteis, Simon R. | 1921 | Brooks, Alexander |
| 1896 | Blodgett, Frank J. | 1904 | Brooks, Harlow |
| 1899 | Bloom, Selina | 1897 | Brouner, Walter B. |
| 1916 | Blum, Theodor | 1922 | Brown, Aaron |
| 1913 | Blumgart, Leonard | 1912 | Brown, Ethel Doty |
| 1916 | Blumgarten, Aaron S. | 1901 | Brown, Samuel A. |
| 1921 | Boas, Ernst P. | 1922 | Brown, Sanger, 2d. |
| 1918 | Bodenheimer, Milton | 1895 | Brown, Willet Stuart |
| 1924 | Boehm, Joseph L. | 1918 | Bruder, Joseph |
| 1926 | Boese, William H. | 1904 | Bryan, William |
| 1917 | Boettiger, Carl | 1904 | Bryant, William Sohier |
| 1925 | Bohrer, John V. | 1904 | Buchler, Augustus F. |
| 1884 | Boldt, Hermann J. | 1909 | Buerger, Leo |
| 1914 | Bolling, Richard W. | 1910 | Bugbee, Henry G. |
| 1916 | Bonime, Ellis | 1874 | Bulkley, L. Duncan |
| 1907 | Bookman, Arthur | 1907 | Bullowa, Jesse G. M. |
| 1918 | Bookman, Milton R. | 1887 | Burch, T. Hamilton |
| 1920 | Boorstein, Samuel W. | 1910 | Burdick, Carl G. |
| 1885 | Booth, J. Arthur | 1915 | Burk, Samuel B. |
| 1887 | Born, Rudolph O. | 1886 | Burke, Martin |
| 1915 | Bowers, Wesley C. | 1922 | Burlingame, C. C. |
| 1916 | Boyd, Carlisle S. | 1920 | Burnham, Athel C. |
| 1904 | Boyer, Arthur A. | 1906 | Burnham, Herbert D. |
| 1925 | Boynton, Perry S. | 1908 | Burrows, Waters Field |
| 1916 | Bradbury, Samuel | 1886 | Burt, Stephen Smith |
| 1914 | Bradshaw, William M. | 1911 | Busby, Archibald H. |
| 1918 | Brandaleone, Joseph | 1893 | Butler, Glentworth R. |
| 1888 | Brannan, John Winters | 1920 | Butterfield, Paul M. |
| 1908 | Braun, Alfred | 1905 | Byard, Dever S. |

1914	Byrne, Joseph	1915	Cherry, Thomas H.
1900	Byrne, Joseph H.	1896	Chetwood, Charles H.
1922	Cahill, George F.	1908	Child, Charles Gardner, Jr.
1885	Caillé, Augustus		
1918	Caldwell, William E.	1924	Chilian, Stephen A.
1920	Calhoun, William C.	1905	Chisholm, William A.
1888	Callan, Peter A.	1901	Cilley, Arthur H.
1914	Callison, James G.	1907	Clark, A. Schuyler
1898	Camac, Charles N. B.	1904	Clark, J. Bayard
1922	Campbell, Ernest A.	1896	Clark, L. Pierce
1902	Campbell, William F.	1922	Clark, Raymond
1924	Cannon, A. Benson	1901	Clemens, James B.
1917	Caples, Byron H.	1879	Cleveland, Clement
1918	Carber, Frank H.	1922	Cleveland, Mather
1902	Carlisle, Robert J.	1894	Coakley, Cornelius G.
1921	Carlucci, Gaston A.	1917	Coca, Arthur F.
1885	Carman, Albro R.	1885	Coe, Henry C.
1922	Carp, Louis	1917	Cofer, Leland E.
1921	Carr, Frank C.	1892	Coffin, Lewis A.
1886	Carr, Walter Lester	1891	Coggeshall, Henry
1905	Carter, Herbert S.	1924	Cohen, Harry
1925	Carter, Rupert F.	1921	Cohen, Ira
1904	Carter, William W.	1919	Cohen, J. Bernard
1920	Casamajor, Louis	1905	Cohen, Martin
1915	Cash, Stanmore L.	1910	Cohn, Alfred E.
1906	Cassebeer, Henry A.	1890	Cohn, Felix
1905	Cassell, James Wilson	1891	Cole, Carter S.
1910	Caturani, Michele G.	1910	Cole, Lewis Gregory
1884	Cauldwell, Charles M.	1909	Cole, Rufus I.
1921	Cave, Henry W.	1915	Coleman, Joseph
1910	Cecil, Russell L.	1904	Coleman, Warren
1909	Celler, Herbert L.	1925	Coley, Bradley L.
1908	Chace, Arthur F.	1892	Coley, William B.
1920	Chalmers, Thomas C.	1910	Colie, Edward M., Jr.
1886	Chapin, Henry Dwight	1925	Collings, Clyde W.
1920	Chaplin, Hugh	1905	Collins, Charles F.
1904	Chard, Marie Louise	1898	Collins, Howard D.
1914	Chargin, Louis	1892	Collins, Joseph
1922	Chase, Herbert C.	1922	Colp, Ralph

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|------|------------------------------|------|--------------------------------|
| 1913 | Conley, Walter H. | 1911 | Darling, Byron C. |
| 1900 | Conner, Lewis A. | 1904 | Darlington, Thomas |
| 1905 | Connors, John F. | 1908 | Darraach, William |
| 1908 | Cooke, Robert A. | 1924 | Davidson, Louis R. |
| 1922 | Coonley, Frederick | 1899 | Davis, A. Edward |
| 1923 | Cornwall, Leon H. | 1909 | Davis, Asa Barnes |
| 1912 | Cornwell, Herbert C.
deV. | 1913 | Davis, Fellowes, Jr. |
| 1910 | Corseaden, James A. | 1909 | Davis, George E. |
| 1921 | Coryell, Clarence C. | 1920 | Davis, Thomas K. |
| 1912 | Coughlin, John Henry | 1922 | Dean, Archie L., Jr. |
| 1922 | Courten, Henry C. | 1920 | Decker, John J. |
| 1925 | Cowett, Max P. | 1904 | de Forest, Henry P. |
| 1924 | Cowles, Henry Clay | 1900 | Delatour, H. Beeckman |
| 1922 | Craig, C. Burns | 1880 | Delavan, D. Bryson |
| 1924 | Craig, Stuart L. | 1918 | Deming, Nelson L. |
| 1908 | Cramp, Walter C. | 1890 | Dench, Edward B. |
| 1921 | Crampton, C. Ward | 1908 | Denenholz, Aaron |
| 1925 | Craver, Lloyd F. | 1902 | Denig, Rudolf |
| 1910 | Crigler, Lewis W. | 1908 | Dennett, Roger H. |
| 1900 | Crispin, Antonio M. | 1879 | Dennis, Frederic S. |
| 1912 | Crohn, Burrill B. | 1916 | Denno, Willard J. |
| 1921 | Cross, Frank B. | 1916 | Denzer, Bernard S. |
| 1926 | Crump, Armistead C. | 1922 | DeSanctis, Adolph
George G. |
| 1922 | Cudmore, John H. | 1915 | DeSanctis, Nicholas M. |
| 1901 | Culbert, William L. | 1917 | Detwiller, Albert K. |
| 1921 | Cunningham, Wm. F. | 1918 | De Vecchi, Paolo |
| 1887 | Currier, Charles G. | 1918 | Diamond, Joseph S. |
| 1915 | Curtin, Thomas H. | 1891 | Dickinson, Robert L. |
| 1923 | Cussler, Edward | 1890 | Dillingham, Frederic H. |
| 1904 | Cutler, Colman W. | 1924 | Dineen, Paul A. |
| 1892 | Cutler, Condict W. | 1917 | Diner, Jacob |
| 1923 | Cutler, Condict W., Jr. | 1922 | di Palma, Salvatore |
| 1922 | Cutter, William D. | 1906 | Ditman, Norman E. |
| 1923 | D'Albora, John B. | 1884 | Dixon, George A. |
| 1886 | Dana, Charles L. | 1906 | Dixon, George S. |
| 1922 | Dannreuther, Walter T. | 1922 | Dodd, Raymond C. |
| 1922 | Danzer, Charles S. | 1887 | D'Oench, Frederick E. |
| 1908 | Danziger, Ernst | 1885 | Dold, William E. |

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|------|--------------------------|------|--------------------------|
| 1921 | Donaldson, Blake F. | 1921 | Eggers, Carl |
| 1922 | Donnelly, William H. | 1915 | Eggleston, Cary |
| 1924 | Donnet, John V. | 1922 | Eggston, Andrew A. |
| 1920 | Doran, William T. | 1891 | Einhorn, Max |
| 1904 | Dorman, Franklin A. | 1924 | Eisberg, Harry B. |
| 1888 | Dorning, John | 1906 | Eisenberg, Isidore C. |
| 1891 | Doty, Alvah H. | 1904 | Eising, Eugene H. |
| 1904 | Dougherty, Daniel S. | 1906 | Eliot, Ellsworth, Jr. |
| 1905 | Douglas, John | 1925 | Eller, Joseph J. |
| 1894 | Douglass, H. Beaman | 1921 | Elliott, Edward S. |
| 1923 | Dourmashkin, Ralph L. | 1886 | Elliott, George R. |
| 1900 | Dow, Edmund LeRoy | 1921 | Elmendorf, Ten Eyck |
| 1889 | Dowd, Charles N. | 1897 | Elsberg, Charles A. |
| 1923 | Dowd, Heman L. | 1921 | Elwyn, Herman |
| 1902 | Downes, William A. | 1894 | Ely, Albert H. |
| 1905 | Downey, Martin | 1904 | Emerson, Haven |
| 1911 | Draper, George | 1925 | Ende, Frank Macbeth |
| 1904 | Draper, John W. | 1913 | Engelson, Joseph E. |
| 1918 | Druskin, Samuel J. | 1911 | Epstein, Albert A. |
| 1901 | Duane, Alexander | 1908 | Epstein, Sigmund |
| 1910 | Du Bois, Eugene F. | 1910 | Erdman, Seward |
| 1911 | Du Bois, Francis E. | 1892 | Erdmann, John F. |
| 1919 | Du Bois, Phebe Lott | 1916 | Evans, Evan M. |
| 1926 | Du Bois, Robert O. | 1900 | Evans, Samuel M. |
| 1917 | Dudley, Guilford S. | 1907 | Everitt, Chauncey V. |
| 1899 | Duel, Arthur B. | 1897 | Ewing, James |
| 1893 | Dunham, Theodore | 1905 | Fahnestock, Ernest |
| 1915 | Dunning, Henry Sage | 1916 | Falk, Henry C. |
| 1916 | Dunning, William M. | 1924 | Famulener, Lemuel W. |
| 1921 | Dunnington, John H. | 1906 | Fanoni, Antonio |
| 1916 | Durkee, John W. | 1909 | Farr, Charles E. |
| 1923 | Duryea, Chester F. | 1912 | Farr, Edgar H. |
| 1923 | Dwight, Kirby | 1914 | Farrar, Lilian K. P. |
| 1913 | Dwyer, James G. | 1910 | Farrell, Benjamin P. |
| 1921 | Echeverria, Frederick J. | 1910 | Faulkner, E. Ross |
| 1922 | Edelman, Leo | 1922 | Fauntleroy, Archibald M. |
| 1922 | Edelman, Moses H. | | |
| 1890 | Edgar, J. Clifton | 1904 | Feinberg, Israel L. |
| 1903 | Edgerton, F. Cruger | 1922 | Feinblatt, Henry M. |

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|------|------------------------|------|-----------------------|
| 1923 | Felberbaum, David | 1918 | Fraser, John F. |
| 1922 | Feldman, Samuel | 1898 | Frauenthal, Henry W. |
| 1908 | Feldstein, Samuel | 1904 | Frauenthal, Herman C. |
| 1922 | Felsen, Joseph | 1923 | Freed, Frederick C. |
| 1904 | Ferguson, Jeremiah S. | 1892 | Freeman, Rowland G. |
| 1907 | Ferguson, Robert H. | 1886 | French, Thomas R. |
| 1924 | Field, Cyrus W. | 1924 | Freudenfall, Benjamin |
| 1906 | Field, Frank H. | 1889 | Freudenthal, Wolff |
| 1920 | Finkelstein, Harry | 1886 | Fridenberg, Albert H. |
| 1913 | Finley, Caroline S. | 1909 | Fried, Gustav A. |
| 1908 | Fischer, Hermann | 1918 | Friedman, Emanuel D. |
| 1890 | Fischer, Louis | 1908 | Friedman, Gedide A. |
| 1913 | Fishberg, Maurice | 1908 | Friedman, Louis |
| 1886 | Fisher, Edward D. | 1913 | Friesner, Isidore |
| 1918 | Fisher, Judson C. | 1907 | Frink, Claude A. |
| 1893 | Fisk, Arthur Lyman | 1904 | Frissell, Lewis F. |
| 1909 | Fisk, Eugene L. | 1919 | Froehlich, Eugene |
| 1924 | Fiske, Edwin Rodney | 1896 | Frothingham, Richard |
| 1895 | Fiske, James Porter | 1888 | Fuhs, Jacob |
| 1896 | Fitch, Allen | 1921 | Fulkerson, Lynn Lyle |
| 1916 | Fitzgerald, Fred J. C. | 1907 | Furniss, Henry Dawson |
| 1920 | Fletcher, Norton | 1924 | Gager, Leslie T. |
| | DeL. L. | 1900 | Gant, Samuel G. |
| 1905 | Flexner, Simon | 1916 | Garbat, Abraham L. |
| 1894 | Flint, Austin | 1918 | Gardner, Faxton E. |
| 1909 | Floyd, Rolfe | 1926 | Garlock, John H. |
| 1922 | Fobes, Joseph H. | 1889 | Garmany, Jasper J. |
| 1899 | Foote, Edward M. | 1924 | Gates, Frederick L. |
| 1914 | Forbes, Henry Hall | 1921 | Gatewood, William L. |
| 1904 | Ford, William M. | 1914 | Gaudiani, Vincent |
| 1911 | Foster, Nellis B | 1926 | Gay, Frederick P. |
| 1919 | Fowler, Robert H. | 1916 | Geiringer, David |
| 1906 | Fowler, Russell S. | 1914 | Geist, Samuel H. |
| 1916 | Fox, Elsie | 1921 | Gelber, Charles N. |
| 1880 | Fox, George H. | 1910 | Gerster, John C. A. |
| 1904 | Fox, Howard | 1901 | Gibb, W. Travis |
| 1906 | Frank, Robert T. | 1877 | Gibney, Virgil P. |
| 1913 | Frankel, Edward, Jr. | 1893 | Gibson, Charles L. |
| 1920 | Fraser, Alexander | 1924 | Gibson, Gordon M. |

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|------|-------------------------------|------|-----------------------|
| 1894 | Gilfillan, W. Whitehead | 1924 | Graham, John R. |
| 1906 | Gillespie, David H. M. | 1910 | Grant, John P. |
| 1921 | Gillette, Curtenius | 1889 | Grauer, Frank |
| 1909 | Gilmour, Andrew J. | 1909 | Grausman, Philip M. |
| 1887 | Girdner, John H. | 1919 | Graves, Gaylord W. |
| 1918 | Glafke, William H. | 1904 | Greeff, J. G. William |
| 1923 | Globus, Joseph H. | 1905 | Green, Nathan W. |
| 1912 | Glogau, Otto | 1925 | Greenberg, David |
| 1918 | Goeller, Charles J. | 1913 | Greene, James S. |
| 1922 | Goetsch, Emil | 1891 | Greene, Robert H. |
| 1887 | Goffe, J. Riddle | 1908 | Gregory, Alice |
| 1900 | Goldan, S. Ormond | 1908 | Gregory, Menas S. |
| 1919 | Goldberger, Isidore H. | 1895 | Griffin, Edward H. |
| 1922 | Goldberger, Lewis A. | 1915 | Gross, Maurice H. |
| 1923 | Golden, Ross | 1909 | Gross, Moritz |
| 1891 | Goldenberg, Hermann | 1918 | Grossman, Morris |
| 1918 | Goldstein, Isidore | 1918 | Grushlaw, Israel |
| 1908 | Goldwater, Sigismund
S. | 1914 | Guile, Hubert V. |
| 1922 | Gonzales, Thomas A. | 1922 | Gulliver, Francis D. |
| 1922 | Goodfellow, Lillian M. | 1898 | Guttman, John |
| 1913 | Goodfriend, Nathan | 1909 | Gwathmey, James T. |
| 1906 | Goodhart, S. Philip | 1901 | Haas, Sidney V. |
| 1899 | Goodman, Abraham L. | 1909 | Haberman, J. Victor |
| 1903 | Goodman, Charles | 1925 | Hajek, Joseph |
| 1924 | Goodman, Herman | 1904 | Hale, Henry Ewing |
| 1906 | Goodridge, Malcolm | 1918 | Hall, John Mead |
| 1922 | Goodwin, Norman C. | 1926 | Hallett, George D. |
| 1922 | Gottesman, Julius | 1891 | Hallock, Silas F. |
| 1922 | Gottlieb, Charles | 1917 | Halpern, Julius |
| 1922 | Gottlieb, Mark J. | 1904 | Halsey, Robert H. |
| 1915 | Gould, Everett W. | 1921 | Halsted, Harbeck |
| 1923 | Grace, Roderick V. | 1903 | Hamlen, George D. |
| 1905 | Grad, Hermann | 1916 | Hanford, John Munn |
| 1908 | Graef, Charles | 1914 | Hansen, Ejnar |
| 1907 | Graeser, Herman R. A. | 1921 | Harkavy, Joseph |
| 1924 | de Graffenried, Anthony
F. | 1904 | Harlow, Ellwood |
| 1925 | Graham, John C. | 1913 | Harrar, James A. |
| | | 1909 | Harrigan, Anthony H. |
| | | 1904 | Harris, E. Eliot |

1918	Harris, Isham Greene	1924	Higgins, William McK.
1921	Harris, Louis I.	1922	Higgins, William M.
1894	Harris, Thomas J.	1910	Highman, Walter J.
1904	Hart, T. Stuart	1917	Hilkowich, Abe M.
1911	Hartshorn, Winfred M.	1903	Hill, Ira L.
1917	Hartshorne, Isaac	1915	Hill, Miner C.
1901	Hartwell, John A.	1887	Hillis, Thomas J.
1918	Hasbrouck, James F.	1914	Hillman, Oliver S.
1902	Haskin, William H.	1909	Hinkle, Beatrice M.
1922	Hatcher, Robert A.	1925	Hinton, J. William
1897	Haubold, Herman A.	1913	Hirsch, I. Seth
1923	Hauswirth, Louis	1921	Hirsh, A. Bern
1895	Hawkes, Forbes	1904	Hitzrot, James M.
1922	Hawkins, William H.	1921	Hoch, George F.
1921	Hawks, Everett M.	1911	Hoguet, Joseph P.
1901	Hayes, William Van V.	1909	Holden, Frederick C.
1897	Haynes, Irving S.	1894	Holden, Ward A.
1907	Haynes, Royal S.	1920	Holladay, Edwin W.
1909	Hays, Harold M.	1907	Holland, Arthur L.
1918	Healy, William P.	1925	Hollander, Edward
1895	Heiman, Henry	1902	Hollister, Frank C.
1918	Heine, Joseph	1921	Honan, William F.
1890	Heitzmann, Louis	1887	Honegger, Oscar P.
1918	Held, Isidore W.	1924	Hooker, Henry L.
1910	Heller, Isaac M.	1906	Hooker, Ransom S.
1909	Hellman, Alfred M.	1904	Hopkins, Frank T.
1921	Hennessy, James P.	1901	Horn, John
1908	Hensel, Otto	1922	Horn, Walter L.
1920	Herly, Louis	1913	Horowitz, Philip
1910	Herrick, William W.	1923	Hough, Perry B.
1922	Herriman, Frank R.	1913	Houghton, Harris A.
1902	Herrman, Charles	1925	Howard, Robert C.
1919	Hertz, Julius J.	1922	Howard, Tasker
1904	Herzfeld, Alfred A.	1923	Howe, Alexander C.
1911	Herzig, Arthur J.	1919	Howe, Hubert S.
1906	Hess, Alfred F.	1905	Hubbard, Ernest V.
1922	Hetrick, Llewellyn E.	1896	Hubbard, William N.
1914	Heyd, Charles Gordon	1901	Hubby, Lester M.
1899	Hibbs, Russell A.	1885	Huber, Francis

1911	Huber, Frederick W.	1904	Jacoby, J. Ralph
1923	Hubert, Louis	1904	Jaeger, Charles H.
1919	Huddleson, James H.	1916	James, Henry
1919	Huey, Arthur J.	1889	James, Walter B.
1918	Huffman, Otto V.	1913	Jarcho, Julius
1910	Hühner, Max	1900	Jarecky, Herman
1911	Humphries, Henry R.	1905	Jarvis, Nathan S.
1916	Humphries, Robert E.	1919	Jeck, Howard S.
1924	Hunt, Charles Jack	1900	Jelliffe, Smith Ely
1905	Hunt, Edward L.	1914	Jellinghaus, C. Frederic
1903	Hunt, J. Ramsay	1918	Jenison, Nancy
1917	Hunt, Westley M.	1921	Jennings, John E.
1925	Huppert, Elmer I.	1922	Joachim, Henry
1901	Hurd, Lee M.	1918	Johnson, Frank E.
1924	Hurd, Ralph A.	1922	Johnson, Kenneth
1920	Hutchinson, Abbott T.	1924	Johnson, Thomas H.
1912	Huvelle, Rene H.	1918	Jones, David H.
1918	Hyams, Joseph A.	1922	Jones, Marvin F.
1882	Hyde, Frederick E.	1909	Jonessoff, Emmanuel
1910	Hyman, Abraham	1904	Judd, Aspinwall
1924	Hyman, Harold T.	1922	Judd, Harold B.
1903	Hymanson, Abraham	1910	Kaempfer, Louis G.
1908	Hynes, William Rose	1918	Kahn, Alfred
1900	Illoway, Henry	1912	Kahn, L. Miller
1923	Imboden, Harry M.	1914	Kahn, Max
1910	Imperator, Charles J.	1918	Kahn, Morris H.
1918	Ingerman, Sergius M.	1909	Kaliski, David J.
1908	Ippolito, Gennaro	1917	Kantor, John L.
1924	Irish, William H.	1910	Kast, Ludwig
1922	Irving, George R.	1876	Katzenbach, William H.
1913	Irving, Peter	1922	Kaufman, Louis R.
1918	Irwin, Frank N.	1906	Kaufmann, Jacob
1909	Isaacs, Harry E.	1918	Kearney, James A.
1915	Ives, Robert F.	1909	Keller, Frederick C.
1908	Jaches, Leopold	1922	Kelley, Catherine Rose
1893	Jackson, Victor Hugo	1909	Kellogg, Edward L.
1905	Jacobson, Sidney D.	1879	Kellogg, Theodore H.
1879	Jacobus, Arthur M.	1920	Kelly, Joseph D.
1885	Jacoby, George W.	1925	Kemp, Edward J.

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|------|----------------------|------|-----------------------|
| 1912 | Kennedy, Foster | 1888 | Koplik, Henry |
| 1914 | Kent, James M. | 1904 | Kosmak, George W. |
| 1904 | Kenyon, James H. | 1911 | Kovács, Richard |
| 1924 | Kenyon, Josephine H. | 1920 | Kraus, Walter M. |
| 1899 | Kerley, Charles G. | 1923 | Krida, Arthur |
| 1919 | Kerley, James H. | 1922 | Kross, Isidor |
| 1913 | Kernan, John D., Jr. | 1917 | Krug, Ernest F. |
| 1901 | Kerrison, Philip D. | 1926 | Ladd, William S. |
| 1922 | Keschner, Moses | 1891 | Ladin, Louis J. |
| 1909 | Kessel, Leo | 1898 | La Fetra, Linnaeus E. |
| 1915 | Key, Ben Witt | 1921 | Laidlaw, George F. |
| 1898 | Keyes, Edward L. | 1907 | Laighton, Florence M. |
| 1919 | Keyes, Harold B. | 1912 | Lamb, Albert R. |
| 1912 | Kilbane, Edward F. | 1910 | Lambert, Adrian V. S. |
| 1895 | Kilham, Eleanor B. | 1893 | Lambert, Alexander |
| 1920 | Kindred, John J. | 1891 | Lambert, Samuel W. |
| 1919 | King, Edward A. | 1897 | Lambert, Walter E. |
| 1915 | King, James J. | 1923 | Lampe, Herman F. |
| 1920 | King, Joseph E. J. | 1918 | Landsman, Arthur A. |
| 1902 | King, Thomas A. | 1922 | Langmann, Alfred G. |
| 1906 | Kingsbury, Jerome | 1918 | Langrock, Edwin G. |
| 1922 | Kinloch, Robert E. | 1910 | Laporte, George L. |
| 1918 | Kirby, George H. | 1897 | Lapowski, Boleslaw |
| 1922 | Kirwin, Thomas J. | 1922 | Lasher, Willis W. |
| 1922 | Klein, Eugene | 1922 | Lattin, Berton |
| 1922 | Klein, William | 1921 | Lau, Frederick T. |
| 1914 | Kleinberg, Samuel | 1920 | Lavandera, Miguel |
| 1925 | Klepper, Julius I. | 1920 | Lavell, Thomas E. |
| 1926 | Klingenstein, Percy | 1908 | Law, Frederick M. |
| 1897 | Knapp, Arnold H. | 1919 | Lawrance, Elliot W. |
| 1918 | Knight, Frank H. | 1903 | Lawrence, George A. |
| 1907 | Knipe, William H. W. | 1921 | Leahy, Sylvester R. |
| 1897 | Knopf, S. Adolphus | 1869 | Leale, Charles A. |
| 1921 | Knopf, Saul | 1908 | Leale, Medwin |
| 1926 | Knox, Leila C. | 1921 | Lederer, Max |
| 1922 | Koffler, Emil | 1897 | Lederman, Moses D. |
| 1924 | Kohn, Jerome L. | 1904 | Lee, Burton J. |
| 1898 | Koller, Carl | 1914 | Leo, Johanna B. |
| 1906 | Kopetzky, Samuel J. | 1910 | Leopold, Jerome S. |

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|------|-----------------------------|------|-------------------------------|
| 1924 | L'Episcopo, Joseph B. | 1910 | Ludlum, Walter D. |
| 1926 | Lester, Charles W. | 1904 | Lumbard, Joseph E. |
| 1902 | Leshure, John | 1898 | Lusk, William C. |
| 1916 | L'Esperance, Elise S. | 1905 | Lyle, Henry H. M. |
| 1905 | Levin, Isaac | 1908 | Lyle, William G. |
| 1919 | Levin, Oscar L. | 1898 | Lynch, John B. |
| 1924 | Levinson, Bernard | 1922 | Lyttle, John D. |
| 1922 | Levy, Robert L. | 1895 | McAlpin, David H. |
| 1911 | Le Wald, Leon T. | 1916 | McAlpin, Kenneth R. |
| 1906 | Lewi, Emily | 1901 | McAuliffe, George B. |
| 1922 | Lewis, Raymond W. | 1903 | McBarron, John D. |
| 1897 | Lewis, Robert | 1918 | McCabe, John |
| 1908 | Lewisohn, Richard | 1922 | McCafferty, Lawrence K. |
| 1911 | Lewson, Maximilian | | |
| 1918 | Lewy, Raphael | 1909 | McCarthy, Joseph F. |
| 1900 | Libman, Emanuel | 1907 | McCaskey, Donald |
| 1910 | Lieb, Charles C. | 1912 | McCastline, William H. |
| 1920 | Lieb, Clarence W. | 1919 | McCombs, Carl E. |
| 1924 | Lightstone, Abraham | 1904 | McCoy, John J. |
| 1891 | Lilienthal, Howard | 1905 | McCreery, Forbes R. |
| 1918 | Lindeman, Howard E. | 1914 | McCreery, John A. |
| 1917 | Linder, William | 1904 | McCullagh, Samuel |
| 1910 | Lloyd, Henry W. | 1921 | McDannald, Clyde E. |
| 1891 | Lloyd, Samuel | 1904 | MacDonald, Carlos F. |
| 1904 | Lobenstine, Ralph W. | 1902 | McDonald, Dennis J. |
| 1888 | Lockwood, George R. | 1887 | Macdonald, George A. |
| 1917 | Loewenstein, Helene Correll | 1914 | MacEvitt, John C. |
| | | 1922 | McGrath, John F. |
| 1920 | Lombardo, Melchiorre | 1903 | McGrath, John J. |
| 1914 | Long, William B. | 1904 | MacGuire, Constantine J. |
| 1919 | Lopez, Jose A. | | |
| 1926 | Loré, John M. | 1919 | MacGuire, Constantine J., Jr. |
| 1917 | Losee, Joseph R. | | |
| 1905 | Loughran, Robert L. | 1922 | MacGuire, Daniel P. |
| 1919 | Love, Andrew J. | 1897 | MacHale, Ferdinand S. |
| 1911 | Lovell, Frederick S. | 1920 | McHenry, Junius H. |
| 1916 | Lowsley, Oswald S. | 1925 | McIntosh, Rustin |
| 1904 | Luckett, William H. | 1908 | MacKee, George M. |
| 1922 | Lucus, Thomas D'Arcy | 1921 | McKendree, Charles A. |

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| 1920 McKenna, William F. | 1918 Mason, Frederic S. |
| 1904 Mackenty, John E. | 1909 Mason, Howard H. |
| 1894 McKernon, James F. | 1882 Mason, Lewis D. |
| 1913 McLean, Stafford | 1904 Mathews, Francis S. |
| 1911 Macleod, William P. | 1909 Matthews, Frank C. |
| 1920 MacNeal, Ward J. | 1924 Matthews, Frederick J. |
| 1917 McNeill, Walter H., Jr. | 1886 May, Charles H. |
| 1910 MacNevin, Malcolm G. | 1907 May, William Ropes |
| 1888 McNutt, Sarah J. | 1918 Maybaum, Jacob L. |
| 1905 MacPhee, John J. | 1892 Mayer, Emil |
| 1908 Macpherson, Duncan | 1918 Mayer, Leo |
| 1909 McPherson, Ross | 1904 Meara, Frank S. |
| 1924 MacRobert, Russell G. | 1905 Meding, Charles B. |
| 1920 McSweeney, Edward S. | 1916 Meeker, Harold D. |
| 1901 McWilliams, Clarence
A. | 1922 Meichner, Frederick H.,
Jr. |
| 1894 Mabbott, J. Milton | 1900 Meierhoff, Edward L. |
| 1920 Mackenzie, George M. | 1918 Mencken, Harry P. |
| 1920 Maddren, William H. | 1920 Merriman, M. Hemingway |
| 1923 Magid, Maurice O. | 1924 Merritt, Katherine K. |
| 1913 Malcolm, Percy E. D. | 1902 Mersereau, William J. |
| 1905 Mallett, George H. | 1885 Meyer, Alfred |
| 1920 Maloney, Edward R. | 1925 Meyer, Herbert Willy |
| 1914 Maloney, William J.
M. A. | 1906 Meyer, Leo B. |
| 1914 Mandel, Arthur R. | 1887 Meyer, Willy |
| 1904 Mandlebaum, Frederick
S. | 1921 Meynen, George K. |
| 1892 Manges, Morris | 1907 Michaelis, Alfred |
| 1925 Manheim, Sigmund | 1904 Michailovsky, Michael |
| 1917 Manley, Herbert D. | 1912 Michel, Leo L. |
| 1923 Mann, Hubert | 1918 Milbank, Samuel |
| 1904 Mannheimer, George | 1906 Miller, Frank E. |
| 1913 Manning, G. Randolph | 1920 Miller, Heymen R. |
| 1920 Marcus, Leopold | 1904 Miller, James Alexander |
| 1921 Marine, David | 1906 Milliken, Seth M. |
| 1921 Marshall, Samuel A. | 1901 Mills, Jackson M. |
| 1911 Martin, Thomas A. | 1924 Mills, Nathaniel |
| 1906 Martin, Walton | 1925 Mitchell, Wendell |
| | 1910 Mittendorf, Alfred D. |
| | 1916 Mixsell, Harold R. |

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| 1926 Moench, Gerard L. | 1903 Nathan, Philip W. |
| 1922 Moffat, Barclay W. | 1921 Neal, Josephine B. |
| 1913 Moffett, Rudolph D. | 1923 Neer, Edmonde DeWitt |
| 1918 Moitrier, William, Jr. | 1922 Neergaard, Arthur E. |
| 1899 Monaelesser, Adolph | 1909 Neuhoof, Harold |
| 1924 Montague, Joseph F. | 1918 Neustaedter, Marcus |
| 1904 Mooney, Henry W. | 1922 Ney, K. Winfield |
| 1909 Moore, Albertus A. | 1908 Niles, Walter L. |
| 1904 Moorhead, John J. | 1918 Nilsen, Arthur |
| 1912 Morris, Dudley H. | 1886 Nilsen, Jonas R. |
| 1923 Morris, John H. | 1917 Nilson, S. John |
| 1890 Morris, Lewis R. | 1905 Norrie, Van Horne |
| 1891 Morris, Robert T. | 1906 Norris, Charles |
| 1925 Morrissey, John H. | 1886 Northrup, William P. |
| 1916 Morrow, Albert S. | 1906 Norton, Nathaniel R. |
| 1891 Mortimer, W. Golden | 1897 Noyes, William B. |
| 1897 Morton, Henry H. | 1908 Nutt, John J. |
| 1910 Morton, Rosalie S. | 1912 Oastler, Frank R. |
| 1900 Moschcowitz, Alexis V. | 1918 Oberndorf, Clarence P. |
| 1906 Moschcowitz, Eli | 1910 Ochs, Benjamin F. |
| 1907 Mosenthal, Herman O. | 1885 Offenbach, Robert |
| 1919 Mosler, Fred H. | 1904 Ogilvy, Charles |
| 1924 Moss, Abraham | 1906 Oppenheimer, Bernard |
| 1908 Moss, L. Howard | S. |
| 1909 Mulholland, Joseph A. | 1912 Oppenheimer, Edgar D. |
| 1918 Munn, Aristine P. | 1907 Oppenheimer, Seymour |
| 1882 Munn, John P. | 1910 Orgel, David H. |
| 1892 Munroe, George E. | 1904 Osgood, Alfred T. |
| 1910 Murphy, Deas | 1908 Osgood, Charles |
| 1906 Murray, Archibald | 1918 Osnato, Michael |
| 1922 Murray, Clay Ray | 1911 Ottenberg, Reuben |
| 1889 Murray, Francis W. | 1908 Oulman, Ludwig |
| 1924 Myers, Florizel deL. | 1909 Packard, Maurice |
| 1905 Myers, Howard G. | 1913 Packer, Flavius |
| 1925 Myers, Lotta Wright | 1906 Page, John R. |
| 1926 Myerson, Mervin C. | 1919 Painter, Henry McM. |
| 1889 Myles, Robert C. | 1921 Palefski, Israel O. |
| 1884 Nammack, Charles E. | 1921 Palmer, Arthur |
| 1903 Napier, Charles D. | 1922 Palmer, Walter W. |

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|------|--------------------------|------|------------------------|
| 1923 | Pardee, Harold E. B. | 1926 | Platt, Anna |
| 1923 | Pardee, Irving H. | 1911 | Plummer, Harry E. |
| 1892 | Park, William H. | 1895 | Polak, John O. |
| 1906 | Parker, Ransom J. | 1920 | Poll, Daniel |
| 1906 | Parodi, Teofilo | 1924 | Pollak, Alfred W. |
| 1908 | Parounagian, Mihran B. | 1891 | Pollitzer, Sigmund |
| 1894 | Parry, Angenette | 1919 | Pond, Erasmus A. |
| 1909 | Parry, Eleanor | 1904 | Poole, Eugene H. |
| 1922 | Parsons, William B., Jr. | 1891 | Porter, William H. |
| 1878 | Partridge, Edward L. | 1924 | Potter, Philip C. |
| 1911 | Pascal, Henry S. | 1913 | Pou, Robert E. |
| 1904 | Patterson, Henry S. | 1922 | Preece, Joseph |
| 1894 | Payne, S. McAllister | 1893 | Pritchard, William B. |
| 1915 | Pearson, Charles E. | 1894 | Pulley, William J. |
| 1910 | Pearson, Henry | 1915 | Pumyea, Peter C. |
| 1910 | Pease, Herbert D. | 1902 | Putnam, Charles R. L. |
| 1913 | Pease, Marshall C., Jr. | 1922 | Pyle, Edwin |
| 1898 | Peck, Charles H. | 1884 | Quackenbos, John D. |
| 1886 | Peckham-Murray, Grace | 1921 | Quick, Douglas A. |
| 1898 | Pedersen, James | 1911 | Quimby, A. Judson |
| 1904 | Pedersen, Victor C. | 1889 | Quinlan, Francis J. |
| 1895 | Peet, Edward W. | 1891 | Quintard, Edward |
| 1923 | Peightal, Thomas C. | 1921 | Rabe, Rudolph F. |
| 1919 | Pellini, Emil J. | 1921 | Rabinowitz, Meyer A. |
| 1923 | Penfield, Wilder G. | 1907 | Rae, John B. |
| 1922 | Perkins, C. Winfield | 1922 | Rafsky, Henry A. |
| 1917 | Perrone, Ettore | 1918 | Ramirez, Maximilian A. |
| 1905 | Peterson, Edward W. | 1916 | Ramsdell, Edwin G. |
| 1888 | Peterson, Frederick | 1924 | Randall, John A. |
| 1922 | Pfeiffer, William | 1920 | Rathbun, Nathaniel P. |
| 1912 | Phelps, Gouverneur M. | 1925 | Ratner, Bret |
| 1921 | Philips, Carlin | 1918 | Ratnoff, Hyman L. |
| 1922 | Philips, Herman B. | 1914 | Rawls, Reginald M. |
| 1886 | Phillips, Wendell C. | 1917 | Ream, Frederick K. |
| 1922 | Phillips, W. Gray, Jr. | 1911 | Reese, Robert G. |
| 1922 | Pickhardt, Otto C. | 1914 | Rehling, Martin |
| 1923 | Pierson, Richard N. | 1904 | Reich, Adolph |
| 1904 | Pinkham, Edward W. | 1921 | Reid, John J., Jr. |
| 1910 | Pisko, Edward | 1914 | Reilly, Thomas F. |

1924	Reiss, Joseph	1917	Ross, Carl A.
1914	Remer, John	1918	Rost, William L.
1912	Reuben, Mark S.	1919	Rostenberg, Adolph
1925	Reynolds, Frederick P.	1906	Roth, Henry
1886	Rhein, Meyer L.	1922	Rothschild, Marcus A.
1887	Rice, Clarence C.	1916	Rothwell, John J.
1921	Rice, Frederick W.	1912	Rowland, Harry H.
1904	Richards, John D.	1923	Rubin, Isidor C.
1910	Richards, John H.	1921	Rulison, Ray H.
1921	Richardson, Henry B.	1908	Russell, James I.
1908	Riesenfeld, Edwin A.	1922	Russell, Thomas H.
1909	Rieser, Willy	1909	Ryder, George H.
1919	Riley, Henry Alsop	1887	Sachs, Bernard
1919	Rimer, Edward S.	1915	St. John, Fordyce B.
1917	Ringer, Adolph I.	1920	St. Lawrence, William P.
1922	Ritter, Henry H.	1918	Salisbury, Lucius A.
1925	Ritter, J. Sydney	1916	Salmon, Thomas W.
1926	Ritter, Saul A.	1925	Salzer, Benjamin
1907	Robbins, Felicia A.	1918	Sammis, Jesse F.
1919	Roberts, Dudley De V.	1913	Samuels, Bernard
1923	Roberts, George W.	1923	Sanders, Theodore M.
1910	Roberts, Percy W.	1921	Sands, Irving J.
1923	Robertson, Victor A.	1921	Santee, Harold E.
1901	Robinovitch, Louis G.	1906	Saril, H. Davison
1923	Robins, Bernard L.	1917	Sartorius, August M.
1912	Robinson, John A.	1918	Satenstein, David L.
1910	Robinson, Meyer R.	1905	Satterlee, G. Reese
1910	Robinson, William J.	1882	Satterthwaite, Thomas E.
1905	Rogers, John	1923	Sauer, Paul Kurt
1919	Rhode, Max S.	1919	Saunders, Truman L.
1915	Rongy, Abraham J.	1920	Sautter, Carl Marion
1908	Roper, Joseph C.	1915	Savini, Carlo
1916	Rosen, Isadore	1887	Sayre, Reginald H.
1911	Rosenbluth, Benjamin	1918	Seadron, Samuel J.
1922	Rosenbluth, Milton B.	1918	Seal, J. Coleman
1923	Rosenheck, Charles	1911	Schapira, Samuel W.
1922	Rosensohn, Meyer	1917	Scheer, Max
1906	Rosenthal, Max		
1922	Rosett, Joshua		

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| 1923 Schiller, Abraham N. | 1905 Shearer, Leander H. |
| 1904 Schlapp, Max G. | 1918 Sheehan, J. Eastman |
| 1903 Schley, Winfield S. | 1907 Sheffield, Herman B. |
| 1918 Schlivek, Kaufman | 1905 Shelby, Edmund P. |
| 1911 Schloss, Oscar M. | 1910 Shine, Francis W. |
| 1908 Schnepel, George A. | 1918 Shlenker, Milton A. |
| 1912 Schoenberg, Mark J. | 1924 Shufelt, William A. |
| 1894 Schram, Charles | 1904 Shultz, Peter David |
| 1918 Schroeder, Louis C. | 1904 Sicard, Montgomery H. |
| 1920 Schulman, Maximilian | 1880 Silver, Henry Mann |
| 1912 Schultze, Ernest C. | 1893 Silver, Lewis Mann |
| 1915 Schwartz, Hans J. | 1921 Siris, Irwin E. |
| 1906 Schwarz, Herman | 1912 Sittenfield, Maurice J. |
| 1922 Schwatt, Herman | 1921 Skinner, Clarence E. |
| 1918 Schweikart, Frederick J. | 1922 Slattey, George N. |
| | 1909 Smart, Isabelle Thompson |
| 1917 Schwerdtfeger, Otto M. | 1923 Smith, Alan DeForest |
| 1922 Scott, Augusta | 1914 Smith, Charles Hendee |
| 1907 Scott, George Dow | 1916 Smith, Clarence H. |
| 1925 Scott, James R. | 1902 Smith, Ernest Ellsworth |
| 1915 Scott, Richard J. E. | 1922 Smith, Goodrich T. |
| 1911 Scruton, William A. | 1901 Smith, Harmon |
| 1891 Seabrook, Harry H. | 1918 Smith, J. Morrisett |
| 1885 Seaman, Louis L. | 1924 Smith, James W. |
| 1925 Seecof, David P. | 1919 Smith, Martin De F. |
| 1914 Seff, Isadore | 1916 Smith, Morris K. |
| 1885 Seibert, August | 1923 Sneed, William L. |
| 1922 Selinger, Jerome | 1918 Snow, William F. |
| 1904 Semken, George H. | 1923 Snyder, Orlow C. |
| 1911 Senior, Harold D. | 1913 Snyder, R. Garfield |
| 1924 Seymour, Nan Gilbert | 1904 Solley, Fred P. |
| 1879 Shaffer, Newton M. | 1905 Solley, John B., Jr. |
| 1921 Shailer, Sumner | 1893 Sondern, Frederic E. |
| 1908 Shannon, John R. | 1925 Sonnenschein, Harry D. |
| 1926 Sharlit, Herman | 1910 Soresi, Angelo L. |
| 1902 Sharp, J. Clarence | 1924 Soule, William L. |
| 1915 Sharpe, Norman | 1902 Sour, Bernard |
| 1914 Sharpe, William | 1894 Southworth, Thomas S. |
| 1920 Shattuck, Howard F. | |

1922	Sovak, Francis W.	1911	Stillman, Alfred, 2d.
1921	Spaulding, Edith Rogers	1923	Stillman, Edgar
1917	Spaulding, Harry Van N.	1918	Stillman, Ernest G.
1918	Spencer, Henry J.	1911	Stillman, Ralph G.
1920	Spiegel, Leo	1896	Stillwell, John E.
1923	Spielberg, William	1887	Stimson, Charles W.
1922	Spies, Edwin A.	1921	Stimson, Philip M.
1896	Squibb, Edward H.	1922	Stivelman, Barnet P.
1901	Squier, J. Bentley	1917	Stokes, Charles F.
1922	Stark, Jesse B.	1898	Stone, William S.
1912	Stark, Meyer M.	1920	Stookey, Byron P.
1910	Stark, Morris	1909	Storey, Thomas A.
1885	Starr, M. Allen	1924	Stout, Arthur Purdy
1889	Stearns, Henry S.	1919	Stowell, David D.
1880	Stedman, Thomas L.	1890	Stowell, William L.
1908	Steel, George Edwin	1918	Strachstein, Abraham
1904	Steese, Edwin S.	1904	Strang, Walter W.
1922	Steffen, Walter C. A.	1908	Strauss, Israel
1908	Stein, Arthur	1913	Strobell, Charles W.
1909	Stein, Sydney A.	1917	Strong, Samuel M.
1918	Steinach, William	1887	Stubenbord, William
1925	Steiner, Joseph M.	1908	Sturges, Leigh F.
1899	Stella, Antonio	1901	Sturmdorf, Arnold
1904	Stephens, Franklin M.	1919	Sturtevant, Mills
1924	Stephens, Richmond	1912	Sullivan, Raymond P.
1917	Stephenson, Junius W.	1902	Sumner, Albert E.
1925	Stepita, C. Travers	1909	Sutherland, Fred B.
1905	Stern, Abram Richard	1908	Sweeny, Thompson
1917	Stern, Adolph	1889	Swift, Edwin E.
1910	Stern, Maximilian	1916	Swift, Homer F.
1919	Stetson, Rufus E.	1888	Syms, Parker
1907	Stetten, De Witt	1906	Talmey, Bernard S.
1909	Stevens, Alex. Raymond	1904	Taylor, Alfred S.
1919	Stevens, Charles W.	1922	Taylor, Charles G.
1916	Stevenson, George	1921	Taylor, Fenton
1895	Stewart, George David	1901	Taylor, Fielding L.
1918	Stewart, John D.	1898	Taylor, Howard C.
1912	Stewart, William H.	1917	Taylor, Joseph C.
		1920	Taylor, Kenneth

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|------|-----------------------|------|--------------------------------|
| 1904 | Taylor, Thomas M. | 1917 | Unger, Arthur S. |
| 1916 | Tenner, Arthur S. | 1924 | Unger, James Samuel |
| 1925 | Tenney, Charles F. | 1918 | Unger, Max |
| 1897 | Terriberry, Joseph F. | 1920 | Urquhart, Howard D. |
| 1918 | Terry, Ira B., Jr. | 1912 | Valentine, Julius J. |
| 1894 | Teschner, Jacob | 1910 | Van Beuren, Frederick
T. |
| 1911 | Thacher, Henry C. | 1906 | Van Cott, Joshua M. |
| 1910 | Theobald, Carl | 1919 | Vandegrift, George W. |
| 1890 | Thomas, Allen M. | 1924 | Van Derwerker, Earl E. |
| 1924 | Thomas, Joseph S. | 1922 | Van Etten, Nathan B. |
| 1904 | Thomas, William S. | 1920 | Van Etten, Royal C. |
| 1904 | Thompson, Hugh C. | 1906 | Van Ingen, Philip |
| 1885 | Thompson, W. Gilman | 1906 | Van Wagenen, Corne-
lius D. |
| 1906 | Thompson, Edgar S. | 1908 | Vaughan, Harold S. |
| 1908 | Thorne, Victor C. | 1915 | Vaughan, John C. |
| 1922 | Thornley, Josiah P. | 1917 | Vedder, Harmon A. |
| 1916 | Throne, Binford | 1916 | Vietor, John A. |
| 1904 | Thurber, Samuel W. | 1890 | Vineberg, Hiram N. |
| 1910 | Tieck, Gustav J. E. | 1922 | Vinton, Cadwallader C. |
| 1915 | Tilney, Frederick | 1914 | Virden, John E. |
| 1901 | Tilton, Benjamin T. | 1913 | Vogel, Karl M. |
| 1906 | Timme, Walter | 1903 | Voislowsky, Antonie P. |
| 1906 | Titus, Edward C. | 1923 | von Lackum, Herman
LeRoy |
| 1921 | Titus, Norman E. | 1925 | Von Sholly, Anna Irene |
| 1922 | Tobin, Thomas J. | 1921 | Voorhees, Irving W. |
| 1909 | Tompkins, Walstein M. | 1902 | Voorhees, James D. |
| 1891 | Torek, Franz J. A. | 1908 | Vosburgh, Arthur S. |
| 1926 | Touart, Maximin D. | 1910 | Wachsmann, Siegfried |
| 1895 | Tousey, Sinclair | 1920 | Wadhams, Robert P. |
| 1908 | Tovey, David W. | 1893 | Walker, John B. |
| 1902 | Townsend, Terry M. | 1903 | Wallace, Charlton |
| 1902 | Tracy, Ira Otis | 1904 | Wallace, George B. |
| 1925 | Traub, Eugene F. | 1908 | Waller, Newton B. |
| 1907 | Travell, J. Willard | 1910 | Wallin, Mathilda K. |
| 1917 | Truesdell, Edward D. | 1904 | Walsh, James J. |
| 1913 | Turek, Fenton B. | 1920 | Walsh, Robert E. |
| 1906 | Turnure, Percy R. | | |
| 1919 | Tyson, Cornelius J. | | |
| 1890 | Tyson, Henry H. | | |

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|------|--------------------------|------|------------------------|
| 1904 | Walsh, Simon J. | 1882 | White, John Blake |
| 1891 | Walter, Josephine | 1920 | White, William C. |
| 1919 | Walter, Milton R. | 1906 | Whiting, Frederick |
| 1920 | Walzer, Abraham | 1920 | Whitman, Armitage |
| 1904 | Wandless, Henry W. | 1891 | Whitman, Royal |
| 1901 | Ward, Freeman F. | 1904 | Wiener, Alfred |
| 1895 | Ward, George Gray | 1914 | Wiener, Herbert J. |
| 1908 | Ward, Wilbur | 1900 | Wiener, Joseph |
| 1901 | Ware, Martin W. | 1883 | Wiener, Richard G. |
| 1914 | Warren, Luther F. | 1908 | Wiener, Solomon |
| 1897 | Warsaw, M. Claudius | 1918 | Wiggers, August F. A. |
| 1925 | Washburn, Arthur L. | 1918 | Wight, Jarvis S. |
| 1921 | Washton, Jacob | 1905 | Wightman, Orrin S. |
| 1895 | Waterman, James S. | 1907 | Wilcox, Herbert B. |
| 1920 | Watson, Cassius H. | 1914 | Wilensky, Abraham O. |
| 1921 | Webster, David H. | 1922 | Willard, Luvia |
| 1919 | Wechsler, Israel S. | | Margaret |
| 1886 | Weeks, John E. | 1893 | Willard, Thomas H. |
| 1920 | Weeks, Webb W. | 1901 | Williams, Anna W. |
| 1925 | Weigel, Elmer P. | 1903 | Williams, Charles M. |
| 1922 | Weil, Henry L. | 1918 | Williams, Frankwood E. |
| 1908 | Weinberger, William | 1916 | Williams, Horatio B. |
| 1910 | Weingarten, Frederick S. | 1904 | Williams, Linsly R. |
| | | 1886 | Williams, Mark H. |
| 1912 | Weinstein, Harris | 1923 | Williams, Percy H. |
| 1880 | Weir, Robert F. | 1905 | Williams, William R. |
| 1917 | Weiss, Ludwig | 1918 | Williamson, Hervey C. |
| 1906 | Welch, John E. | 1905 | Wilner, Anna S. |
| 1909 | Welker, Franklin | 1918 | Wilson, Arthur S. |
| 1894 | Welt-Kakels, Sara | 1900 | Wilson, Frederic N. |
| 1914 | Wessler, Harry | 1920 | Wilson, John E. |
| 1916 | West, Davenport | 1917 | Wilson, May G. |
| 1897 | West, James N. | 1906 | Wilson, Robert J. |
| 1911 | Wheeler, John M. | 1921 | Wilson, William A. |
| 1926 | Wheelwright, Joseph S. | 1914 | Wing, Lucius A. |
| 1915 | Whipple, Allen O. | 1909 | Wise, Fred |
| 1915 | Whitbeck, Brainerd H. | 1924 | Witt, Dan Hiter |
| 1911 | White, Francis W. | 1922 | Wolf, Charles |
| 1920 | White, James W. | 1922 | Wolf, George D. |

1912	Wolf, Heinrich Franz	1918	Wyckoff, John H.
1899	Wolff, Julius	1910	Wyeth, George A.
1901	Wollstein, Martha	1889	Wylie, Robert H.
1911	Wood, Francis C.	1924	Wynne, Shirley W.
1924	Wood, Thomas D.	1904	Yankauer, Sidney
1908	Woodman, John	1908	Yoemans, Frank C.
1910	Woodruff, I. Ogden	1921	de Yoanna, Gaetano
1904	Woolley, Scudder J.	1893	Young, John Van Doren
1891	Woolsey, George	1908	Zabriskie, Edwin G.
1896	Wootton, Herbert W.	1921	Zadek, Isadore
1917	Worcester, James N.	1913	Zingher, Abraham
1917	Wright, Arthur M.	1909	Zipser, Jacques E.

FELLOWS RESIDING OUTSIDE NEW YORK CITY

1923	Ackerman, James F., 1010 Grand Ave., Asbury Park, N. J.
1906	Adler, Herman M., 721 So. Wood St., Chicago, Ill.
1903	Adrianee, Vanderpoel, The Perch, Williamstown, Mass.
1922	Aikman, John, 184 Alexander St., Rochester, N. Y.
1919	Allen, Henry Willard, Ridgefield, Conn.
1911	Almgren-Dederer, Ebba E., 529 Union Ave., Paterson, N. J.
1907	Amesse, John W., 624 Metropolitan Bldg., Denver, Colo.
1884	Andrews, Joseph A., Santa Barbara, Cal.
1888	Armstrong, Samuel T., Hillbourne Club, Katonah, N. Y.
1906	Arnold, Ernst H., 1460 Chapel St., New Haven, Conn.
1908	Avery, John Waite, 1780 Highland Ave., Hollywood, Cal.
1882	Bacon, Gorham, Rhu Cottage, Yarmouthport, Mass.
1904	Baker, Sara Josephine, Long Ridge, Stamford, Conn.
1916	Baldwin, Edward R., Saranac Lake, N. Y.
1920	Banker, George T., 1060 East Jersey St., Elizabeth, N. J.
1906	Barnum, Merritt W., 7 and 9 Ellis Place, Ossining, N. Y.
1924	Barr, David P., 600 So. Kingshighway, St. Louis, Mo.
1915	Bartholomew, Henry S., Napanoch, Ulster Co., N. Y.
1914	Beck, August Leo, Professional Bldg., New Rochelle, N. Y.
1897	Bell, J. Finley, Englewood, N. J.
1921	Benson, Arthur W., 2 St. Paul's Place, Troy, N. Y.
1900	Bickham, Warren S., 1810 Massachusetts Ave., N. W., Washington, D. C.

- 1908 Black, John Fielding, 247 Main St., White Plains, N. Y.
 1920 Blaisdell, Russell E., Kings Park, L. I., N. Y.
 1918 Blake, Eugene M., 282 Prospect St., New Haven, Conn.
 1924 Blosser, Roy, 224 Thayer St., Providence, R. I.
 1908 Blumer, George, 841 Whitney Ave., New Haven, Conn.
 1919 Bonnell, Clarence H., Boston Post Road, Rye, N. Y.
 1897 Booth, Burton S., 60 Second St., Troy, N. Y.
 1916 Bortone, Frank, 2765 Boulevard, Jersey City, N. J.
 1907 Bradford, Stella S., 16 Seymour St., Montclair, N. J.
 1907 Brown, David Chester, 330 Main St., Danbury, Conn.
 1915 Brown, Lawrason, Saranac Lake, N. Y.
 1920 Brundage, Walter H., 205 Pelhamdale Ave., Pelham, N. Y.
 1880 Brush, Edward F., 330 So. Fifth Ave., Mt. Vernon, N. Y.
 1910 Buckmaster, Clarence W., 80 Ashburton Ave., Yonkers, N. Y.
 1879 Bullard, William E., Prospect Ave., Larchmont, N. Y.
 1912 Bumsted, Clarence van R., 235 Grafton Ave., Newark, N. J.
 1914 Burnap, Sidney R., 3087 Wilshire Blvd., Los Angeles, Cal.
 1917 Butler, Eustace C., 249 Bloomfield Ave., Caldwell, N. J.
 1891 Cabot, John, 42 King Ave., Weehawken, N. J.
 1890 Campbell, Archibald M., 36 First Ave., Mt. Vernon, N. Y.
 1904 Canfield, R. Bishop, Ann Arbor, Mich.
 1921 Carlisle, John H., 129 Prospect St., Passaic, N. J.
 1908 Carter, C. Edgerton, Brockman Bldg., Los Angeles, Cal.
 1909 Castelli, Alfonso, 14 Via Lombardia, Rome, Italy.
 1923 Cavanaugh, Thomas E., 293 Bridge St., Springfield, Mass.
 1895 Chambers, Talbot R., Hamilton, Bermuda.
 1906 Chapman, Charles F., Mt. Kisco, N. Y.
 1912 Chapman, Sophia U., 165 E. 4th St., Oswego, N. Y.
 1924 Charlton, Herbert R., 89 Pondfield Road, Bronxville, N. Y.
 1911 Chittenden, Arthur S., 109 Oak St., Binghamton, N. Y.
 1925 Christensen, Frederick C., 2250 Kinzie Ave., Racine, Wis.
 1911 Clock, Ralph O., Pearl River, N. Y.
 1897 Comstock, George F., Saratoga Springs, N. Y.
 1907 Conaway, Walt P., 1723 Pacific Ave., Atlantic City, N. J.
 1904 Connell, Karl, 2954 Harvey St., Omaha, Neb.
 1922 Conrad, Edgar K., Hospital Ave., Hackensack, N. J.
 1920 Corbusier, Harold D., 612 Park Ave., Plainfield, N. J.

- 1909 Corwin, Arthur S., Rye, N. Y.
 1906 Curry, Grove P. M., Mt. Kisco, N. Y.
 1910 Davison, Wesley T., 1023 Belmont Ave., Victoria, B. C.
 1911 Day, Fessenden L., 819 Myrtle Ave., Bridgeport, Conn.
 1911 Dayton, Hughes, Barney Park, Irvington-on-Hudson, N. Y.
 1879 De Garmo, William B., 61 Palmer Ave., Larchmont, N. Y.
 1911 Derby, Richard, Oyster Bay, L. I., N. Y.
 1916 De Vausney, Winfield S., 2 Lombardy St., Newark, N. J.
 1915 Dieffenbach, Richard H., 570 Mt. Prospect Ave., Newark, N. J.
 1904 Divine, Alice, Ellenville, N. Y.
 1895 Dobson, William G., 35 Market St., Poughkeepsie, N. Y.
 1912 Drake, Bertrand F., 75 Main St., New Rochelle, N. Y.
 1921 Durham, Herbert A., 527 Wilkinson St., Shreveport, La.
 1924 Dye, John Sinclair, 111 W. Main St., Waterbury, Conn.
 1917 Eaton, Alvin R., Jr., 1157 E. Jersey St., Elizabeth, N. J.
 1920 Eaton, Henry Douglas, 1136 W. Sixth St., Los Angeles, Cal.
 1921 Edwards, James B., 144 Woodridge Place, Leonia, N. J.
 1899 Elliott, George T., The Cape, E. Otisfield, Oxford, Me.
 1906 Estes, William L., South Bethlehem, Pa.
 1923 Farnell, Frederick J., 598 Angell St., Providence, R. I.
 1885 Farrington, William H., Raubsville, Pa.
 1891 Ferris, Albert W., The Glen Springs, Watkins, N. Y.
 1922 Finke, George W., 237 State St., Hackensack, N. J.
 1911 Fitz, George W., Peconic, L. I., N. Y.
 1912 Fitzgerald, Clara P., 137 Pleasant St., Worcester, Mass.
 1920 Fleischner, Emanuel C., 384 Post St., San Francisco, Cal.
 1919 Flynn, Thomas J., Surgeon General's Office, Washington, D. C.
 1918 Ford, Clyde E., 2417 Prospect Ave., Cleveland, Ohio.
 1918 Frink, Horace W., Southern Pines, N. C.
 1912 Fuchsius, John H., 151 Centre Ave., New Rochelle, N. Y.
 1889 Fuller, Eugene, care Fifth Avenue Bank, 530 Fifth Ave., New York, N. Y.
 1910 Funk, Joseph, 615 Elizabeth Ave., Elizabeth, N. J.
 1913 Garcin, Ramon D., 2618 E. Broad St., Richmond, Va.
 1920 Gardner, Charles W., 449 State St., Bridgeport, Conn.

- 1922 Garvin, William C., Binghamton State Hospital, Binghamton, N. Y.
- 1915 Getty, Samuel E., 84 Ashburton Ave., Yonkers, N. Y.
- 1925 Ginsberg, George, 624 Bloomfield St., Hoboken, N. J.
- 1922 Glazebrook, Francis H., 171 South St., Morristown, N. J.
- 1908 Goodridge, Frederic G., Pomfret Centre, Conn.
- 1916 Gordinier, Hermon C., 89 Fourth St., Troy, N. Y.
- 1881 Gorton, Orren A., P. O. Box 463, Sherburne, N. Y.
- 1890 Greene, William F., 431 N. Braddock St., Winchester, Va.
- 1908 Greenway, James C., 400 Prospect St., New Haven, Conn.
- 1901 Griffith, Frederic, 2031 Columbia Ave., Philadelphia, Pa.
- 1909 Guion, Clarence C., 175 Centre Ave., New Rochelle, N. Y.
- 1908 Guntzer, John H., 51 No. Regent St., Port Chester, N. Y.
- 1926 Hall, Fairfax, Professional Bldg., New Rochelle, N. Y.
- 1919 Hallett, Frederick S., 200 Passaic St., Hackensack, N. J.
- 1920 Hammond, Robert B., Sterling Ave., White Plains, N. Y.
- 1887 Hance, Irwin H., Lakewood, New Jersey.
- 1914 Hannock, Elwin W., 363 State St., Albany, N. Y.
- 1919 Hartshorn, Willis E., 67 Trumbull St., New Haven, Conn.
- 1921 Harvey, Samuel Clark, New Haven Hospital, New Haven, Conn.
- 1925 Haseltine, Sherwin L., 410 Westminster Ave., Elizabeth, N. J.
- 1915 Hawley, George W., 144 Golden Hill St., Bridgeport, Conn.
- 1913 Hebert, Paul Z., 5813 So. Haas Ave., Los Angeles, Cal.
- 1922 Heddens, Vernon O., Professional Bldg., Pasadena, Cal.
- 1910 Henderson, Alfred C., 55 Glenbrook Road, Stamford, Conn.
- 1911 Herring, Robert A., McAdoo Bldg., Greensboro, N. C.
- 1915 Hicks, Horace M., 19 Division St., Amsterdam, N. Y.
- 1912 Hoagland, Bonn. W., Barron Ave., Woodbridge, N. J.
- 1915 Holding, Arthur F., 142 Washington Ave., Albany, N. Y.
- 1901 Holmes, Edwin, Exeter, N. H.
- 1918 Horn, James F., 139 South St., Morristown, N. J.
- 1905 Hotchkiss, Lucius W., San Marcos Bldg., Santa Barbara, Cal.
- 1912 Hotwet, Henry A., Weehawken, New Jersey.
- 1915 Howland, De Ruyter, Stratford, Connecticut.

- 1904 Howland, John, Johns Hopkins Hospital, Baltimore, Md.
- 1906 Howley, Bartholomew M., 419 George St., New Brunswick, N. J.
- 1916 Hughes, Frederic J., 706 Park Ave., Plainfield, N. J.
- 1888 Hume, William A., 63 Seasongood Rd., Forest Hills, N. Y.
- 1923 Hutchison, Fred R., 803 Washington St., Huntingdon, Pa.
- 1920 Isham, Mary K., 851 Oak St., Walnut Hills, Cincinnati, O.
- 1917 Jackson, Chevalier, 128 S. 10th St., Philadelphia, Pa.
- 1924 Jackson, Elmer C., 98 Washington St., East Orange, N. J.
- 1911 Jacobson, Frederick C., 1074 Broad St., Newark, N. J.
- 1910 Jaffin, Abraham E., 41 Emory St., Jersey City, N. J.
- 1908 Jameson, James W., 5 S. State St., Concord, N. H.
- 1912 Jean, George W., San Marcos Bldg., Santa Barbara, Cal.
- 1906 Jennings, Walter B., Connecticut State Hospital, Middletown, Conn.
- 1922 Jessup, Everett C., Roslyn, L. I., New York.
- 1910 Johnson, Frederic M., 25 Morris St., Yonkers, N. Y.
- 1921 Joseph, Morris, 271 Lexington Ave., Passaic, N. J.
- 1890 Kammerer, Frederic J., Lohn Kehrsatz, Bern, Switzerland.
- 1906 Kann, Ulysses S., 77 Main St., Binghamton, N. Y.
- 1915 Keller, Franklin J., 795 Broadway, Paterson, N. J.
- 1905 Keppler, Carl R., 138 Clinton Ave., Newark, N. J.
- 1923 Klaus, Henry, 435 Palisade Ave., Union City, N. J.
- 1892 Klotz, Hermann G., 134 West Post Rd., White Plains, N. Y.
- 1922 Knapp, Richard E., 25 Hudson St., Hackensack, N. J.
- 1909 Koch, Louis A., 16 Chestnut St., Newark, N. J.
- 1907 Lambert, Frederick E., 157 Ocean Ave., Jersey City, N. J.
- 1916 Lambert, Robert A., Faculdade De Medicina, Sao Paulo, Brazil.
- 1916 Lane, John E., 59 College St., New Haven, Conn.
- 1921 Lange, Louis C., 20 Clifton Terrace, Weehawken, N. J.
- 1912 Lathrope, George H., 6 Altamont Court, Morristown, N. J.
- 1917 Lavinder, Claude H., U. S. Marine Hospital, Stapleton, N. Y.
- 1923 Lawrence, Watson A., 204 Martine Ave., White Plains, N. Y.
- 1910 Leake, James Payton, Hygienic Laboratory, Washington, D. C.

- 1918 Lee, Edward W., 19 Center St., Randolph, N. Y.
 1926 Leshin, Hiram R., 6 S. Main St., Port Chester, N. Y.
 1908 Littell, Elton G., 149 Park Avenue, Yonkers, N. Y.
 1924 Littwin, Charles, Edgewater, N. J.
 1917 Livengood, Horace R., 1105 E. Jersey St., Elizabeth, N. J.
 1906 Long, Eli, Lafayette Ave., Lakewood, N. J.
 1912 Longcope, Warfield T., Johns Hopkins Hospital, Baltimore, Md.
 1924 Luippold, Eugene John, 85 Columbia Terrace, Weehawken, N. J.
 1904 Lyman, Francis R., Broadway, Hastings-on-Hudson, N. Y.
 1904 Lynch, Robert J., 52 Courtland St., Bridgeport, Conn.
 1909 MacCallum, William G., Johns Hopkins Hospital, Baltimore, Md.
 1924 McCann, William S., School of Med., Univ. of Roch., Rochester, N. Y.
 1908 McGavock, Edward P., Med. Arts Bldg., E. Franklin St., Richmond, Va.
 1885 McKim, W. Duncan, 1701 18th St., N.W., Washington, D. C.
 1897 Mann, John, Old Westbury, Nassau Co., N. Y.
 1913 Marsh, Elias Joseph, 400 Van Houten St., Paterson, N. J.
 1884 Mendelson, Walter, 639 Church Lane, Germantown, Phila., Pa.
 1923 Mendez, Albert A., Punta San Juan, Cuba.
 1926 Metzger, Jeremiah H., Tucson, Ariz.
 1905 Meyer, Adolf, Johns Hopkins Univ., Baltimore, Md.
 1907 Mial, L. L. May, 38 Elm St., Morristown, N. J.
 1905 Miller, Ansel I., Brattleboro, Vermont.
 1910 Milne, Lindsay S., 1800 Federal Res. Bldg., Kansas City, Mo.
 1919 Miner, Donald, 921 Bergen Ave., Jersey City, N. J.
 1917 Mitchell, Charles R., 311 Broadway, Paterson, N. J.
 1891 Moffat, Henry, 139 Park Ave., Yonkers, N. Y.
 1912 Morgan, William Gerry, 1624 Eye St., Washington, D. C.
 1922 Morrill, Ashley B., Bronxville, N. Y.
 1921 Morrissey, Michael J., 18 Asylum St., Hartford, Conn.
 1916 Mott, Walter Wesley, 43 Waller Ave., White Plains, N. Y.
 1913 Mount, Walter B., 21 Plymouth St., Montclair, N. J.

- 1916 Nelson, Aaron, 462 Jersey Ave., Jersey City, N. J.
- 1916 Neuman, Leo H., 194 State St., Albany, N. Y.
- 1923 Neumann, Theodore W., Central Valley, N. Y.
- 1908 Newman, Emanuel D., 81 New St., Newark, N. J.
- 1902 Nicoll, Matthias, Jr., N. Y. State Dept. of Health, Albany, N. Y.
- 1897 Nisbet, James D., Van Wyck, So. Carolina.
- 1913 Ober, George E., 144 Golden Hill St., Bridgeport, Conn.
- 1906 Oertel, Horst, Royal Victoria Hospital, Montreal, Canada.
- 1883 Olds, Frank W., Williamstown, Mass.
- 1910 Oppenheimer, Frederick G., Arcadia Pl., San Antonio, Texas.
- 1897 Orleman-Robinson, Daisy M., U.S.P.H. Service, 16 Seventh St., S.W., Washington, D. C.
- 1871 Packard, Charles W., 2149 Elm St., Stratford, Conn.
- 1915 Pappenheimer, Alwin M., Hartsdale, N. Y.
- 1912 Parker, Edward O., Greenwich, Conn.
- 1921 Parker, Jason S., 7 Chester Ave., White Plains, N. Y.
- 1893 Paton, Stewart, Princeton, N. J.
- 1920 Patterson, Daniel C., 144 Golden Hill St., Bridgeport Conn.
- 1905 Peck, George A., Professional Bldg., New Rochelle, N. Y.
- 1880 Perry, John G., 371 Commonwealth Ave., Boston, Mass.
- 1924 Phillips, Frank L., 405 Temple St., New Haven, Conn.
- 1898 Pilgrim, Charles W., Central Valley, N. Y.
- 1907 Proctor, James W., Englewood, N. J.
- 1905 Prout, Thomas P., Fair Oaks, Summit, N. J.
- 1920 Pyle, Wallace, 15 Exchange Pl., Jersey City, N. J.
- 1909 Quinn, Stephen T., 326 South Broad St., Elizabeth, N. J.
- 1922 Rainey, John J., 104 Second St., Troy, N. Y.
- 1925 Randel, William A., 10 S. 3rd Ave., Mount Vernon, N. Y.
- 1909 Randolph, John M., Rahway, N. J.
- 1912 Rayevsky, Charles, Liberty, N. Y.
- 1919 Raynor, Mortimer W., Kings Park, L. I., N. Y.
- 1909 Reid, George C., 219 N. Washington St., Rome, N. Y.
- 1916 Reynolds, Harry S., South Manchester, Conn.
- 1905 Riggs, Austen Fox, Stockbridge, Mass.
- 1924 Robbin, Lewis, 18 Clinton Place, Newark, N. J.
- 1917 Robert, Daniel R., New Lebanon Center, N. Y.

- 1925 Roberts, Edward R., 144 Golden Hill St., Bridgeport, Conn.
- 1904 Robertson, Joseph A., 918 Mercantile Bk. Bldg., Dallas, Texas.
- 1920 Robinson, Horace Eddy, Pleasantville, N. Y.
- 1920 Roemer, Jacob, 213 Broadway, Paterson, N. J.
- 1924 Rooney, James Francis, 132 Lancaster St., Albany, N. Y.
- 1896 Rushmore, Edward C., Tuxedo Park, N. Y.
- 1920 Russell, Thomas H., 57 Trumbull St., New Haven, Conn.
- 1913 Russell, Worthington S., Woodbury Falls, Orange Co., N. Y.
- 1905 Sadlier, James E., 295 Mills St., Poughkeepsie, N. Y.
- 1907 Sauer, J. George, P. O. Box 253, Passagrille, Fla.
- 1908 Schlichter, Charles H., 556 N. Broad St., Elizabeth, N. J.
- 1914 Scofield, Raymond B., 150 Elliott Ave., Yonkers, N. Y.
- 1884 Scott, George, 12 So. Montgomery Ave., Atlantic City, N. J.
- 1909 Shangle, Milton A., 1143 E. Jersey St., Elizabeth, N. J.
- 1921 Shapiro, Louis G., 375 Broadway, Paterson, N. J.
- 1904 Sharp, Edward A., 81 Linwood Ave., Buffalo, N. Y.
- 1909 Shenier, Leo H., 50 Lincoln Ave., Grantwood, N. J.
- 1909 Sherman, Elbert S., 310 Mount Prospect Ave., Newark, N. J.
- 1919 Sill, Elisha M., 126 Rutgers St., Rochester, N. Y.
- 1925 Simpson, Charles A., 1610 20th St., Washington, D. C.
- 1920 Sinnott, John J., 10 So. 3rd Ave., Mt. Vernon, N. Y.
- 1915 Slocum, Harry B., 186 Chelsea Ave., Long Branch, N. J.
- 1917 Smith, Charles A., 46 Prospect St., New Rochelle, N. Y.
- 1914 Smith, Dorland, 836 Myrtle Ave., Bridgeport, Conn.
- 1908 Smith, E. Terry, 35 Pearl St., Hartford, Conn.
- 1924 Smith, Ellsworth J., 51 Beach Ave., Larchmont, N. Y.
- 1909 Smith, George Milton, 111 Buckingham St., Waterbury, Conn.
- 1921 Smith, Scott L., 113 Academy St., Poughkeepsie, N. Y.
- 1924 Smith, Thayer Adams, Short Hills, N. J.
- 1920 Snyder, William H., 202 Grand St., Newburgh, N. Y.
- 1908 Sorapure, Victor E., 49 Wimpole St., London, England.
- 1894 Spence, Daniel B., R. F. D. 2, Box 42, Morristown, N. J.
- 1914 Sperry, Frederick N., 42 College St., New Haven, Conn.

- 1910 Spickers, William, 6 Church St., Paterson, N. J.
 1908 Stern, Arthur, 224 E. Jersey Ave., Elizabeth, N. J.
 1912 Stevens, Carol T., 169 Centre Ave., New Rochelle, N. Y.
 1922 Stevenson, Holland N., 160 Harmon Ave., Pelham, N. Y.
 1915 Stone, Harry Russell, Clinton, Conn.
 1914 Stoner, George W., 84 Norwood Ave., Stapleton, S. I.,
 N. Y.
 1912 Stover, Charles, Amsterdam, N. Y.
 1907 Stratton, Edward A., 173 Main St., Danbury, Conn.
 1917 Sweet, Charles C., 13 Maple Place, Ossining, N. Y.
 1920 Taylor, George Herbert, Maplewood, N. J.
 1918 Terry, Benjamin T., The Toledo Hospital, Toledo, Ohio.
 1914 Thalhimer, William, Columbia Hospital, Milwaukee, Wis.
 1918 Thoms, Herbert, 59 College St., New Haven, Conn.
 1907 Thomson, John J., 3 Park Ave., Mt. Vernon, N. Y.
 1911 Tileston, Wilder, 101 Grove St., New Haven, Conn.
 1913 Titus, Henry W., 421 Huguenot St., New Rochelle, N. Y.
 1895 Toms, S. W. Spencer, Nyack, N. Y.
 1924 Tooker, Harold Clifton, 1176 Worthington St., Spring-
 field, Mass.
 1923 Turrell, Guy H., Smithtown Branch, L. I., N. Y.
 1911 Tweddell, Francis, Great Neck, L. I., N. Y.
 1916 Vander Bogert, Frank, 111 Union St., Schenectady, N. Y.
 1888 Van Valzah, William W., 306 Los Olivos St., Santa Bar-
 bara, Cal.
 1924 Vier, Henry John, 34 Grand St., White Plains, N. Y.
 1896 Vietor, Agnes C., Trinity Court, Boston, Mass.
 1908 Vogeler, William J., 177 Palisade Ave., Yonkers, N. Y.
 1924 von Deesten, Henry T., 618 Garden St., Hoboken, N. J.
 1907 Wadsworth, Augustus B., Dir. of Laboratories, New Scot-
 land Ave., Albany, N. Y.
 1918 Wahlig, Herman G., Sea Cliff, Nassau Co., N. Y.
 1889 Waldo, Ralph, Westhampton, N. Y.
 1913 Waldron, Louis V., 27 Radford St., Yonkers, N. Y.
 1904 Walker, Emma E., R. F. D., Rockfall, Conn.
 1907 Wallhauser, Henry J. F., 47 New St., Newark, N. J.
 1908 Ward, Alfred Wyckoff, Demarest, N. J.
 1910 Ward, George H., 240 Engle St., Englewood, N. J.
 1915 Warner, John W., 1029 Vermont Ave., Washington, D. C.

- 1891 Weiss, Julius, San Anselmo, Cal.
 1921 Wertheimer, Herbert G., Westinghouse Bldg., Pittsburgh, Pa.
 1922 West, Theodore Stephen, United Hospital, Portchester, N. Y.
 1909 White, Davenport, 2226 Connecticut Ave., Washington, D. C.
 1914 Wilson-Prevost, Charles A., 28 Avenue D'Jena, Paris, France.
 1917 Wise, Lester D., 119 Morris Ave., Long Branch, N. J.
 1905 Wolff, Henry A., 360 S. Grand Ave., Pasadena, Cal.
 1885 Wood, Wm. Benjamin, Onteora Park, Tannersville, N. Y.
 1921 Woodland, Edward E., U. S. Naval Hosp., Pensacola, Fla.
 1917 Woodruff, Stanley R., 16 Enos Place, Jersey City, N. J.
 1889 Wright, Jonathan, Windy Rock, Pleasantville, N. Y.
 1926 Wyatt, Bernard L., 123 S. Stone Ave., Tucson, Ariz.
 1924 Wynkoop, Edward J., 501 James St., Syracuse, N. Y.
 1914 Yocum, Joseph G., 25 Roberts St., Middletown, N. Y.
 1910 Youmans, Vincent J., Ballston Spa., N. Y.
 1910 Young, Anna R., Maine General Hospital, Portland, Maine.
 1910 Young, Charles H., Maine General Hospital, Portland, Maine.
 1923 Yudkin, Arthur M., 257 Church St., New Haven, Conn.
 1920 Zinsser, Hans, 240 Longwood Ave., Boston, Mass.

ASSOCIATE FELLOWS

- 1898 Alling, Arthur N., 257 Church St., New Haven, Conn.
 1898 Ard, Frank C., 604 Park Ave., Plainfield, N. J.
 1898 Atkinson, James William, 27 Church St., Paterson, N. J.
 1912 Beard, Stanley Drew, Lederle Antitoxin Laboratories, Pearl River, N. Y.
 1905 Beling, Christopher C., 111 Clinton Ave., Newark, N. J.
 1896 Boyd, John C., 1621-22 St., N.W., Washington, D. C.
 1895 Brien, William M., 449 Main St., Orange, N. J.
 1900 Brooks, Frank Terry, 309 Milbank Ave., Greenwich, Conn.
 1895 Brown, James S., 43 S. Fullerton Ave., Montclair, N. J.
 1905 Brownlee, Harris F., 342 Main St., Danbury, Conn.

- 1897 Bull, Edward Leonard, 124 E. State St., Ithaca, N. Y.
 1897 Calef, J. Francis, Middletown, Conn.
 1922 Cooke, Elizabeth, Shippan Point, Stamford, Conn.
 1898 Corwin, Theodore W., 146 Second Ave., Newark, N. J.
 1910 Davenport, Charles B., Cold Spring Harbor, N. Y.
 1902 Demarest, Frederick F. C., 29 Academy St., Passaic, N. J.
 1897 Dickinson, Gordon K., 280 Montgomery St., Jersey City,
 N. J.
 1898 Eagleton, Wells P., 15 Lombardy St., Newark, N. J.
 1902 Emerson, Linn, Metropolitan Bldg., Orange, N. J.
 1920 Fine, Morris S., 37 Lathrop Ave., Battle Creek, Mich.
 1904 Gelbach, Rudolph W., 75 Tenth St., Hoboken, N. J.
 1896 Godfrey, Charles C., 340 State St., Bridgeport, Conn.
 1897 Graves, William B., 426 Main St., East Orange, N. J.
 1914 Greenwald, Isidor, 317 East 57th St., New York, N. Y.
 1896 Hallock, Frank K., Cromwell, Conn.
 1911 Harris, Isaac F., Park View, Tuckahoe, N. Y.
 1897 Harvey, Thomas W., 463 Main St., Orange, N. J.
 1897 Hedges, B. Van Doren, 1225 Watchung Ave., Plainfield,
 N. J.
 1900 Hedges, Ellis W., 703 Watchung Ave., Plainfield, N. J.
 1926 Heft, Hattie Louise, 509 W. 21st St., New York, N. Y.
 1903 Hyde, Fritz Carleton, Putnam Ave., Greenwich, Conn.
 1894 Ill, Edward J., 1002 Broad St., Newark, N. J.
 1910 Jackson, Holmes C., 338 East 26th St., New York, N. Y.
 1923 Krasnow, Frances, 437 West 59th St., New York, N. Y.
 1896 Leach, Philip, Columbia Trust Co., 358 Fifth Ave., New
 York, N. Y.
 1905 Lee, Frederic S., 437 West 59th St., New York, N. Y.
 1925 Lewinski-Corwin, E. H., 445 Riverside Drive, New York,
 N. Y.
 1921 Little, Clarence C., University of Michigan, Ann Arbor,
 Mich.
 1894 Lowe, Russell W., Ridgefield, Conn.
 1904 Lusk, Graham, 580 Park Ave., New York, N. Y.
 1899 McCoy, John C., 292 Broadway, Paterson, N. J.
 1900 McLaughlin, George E., 41 Crescent Ave., Jersey City,
 N. J.
 1905 Mandel, John A., 338 East 26th St., New York, N. Y.

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|---|--|
| *Fowler, Edward Payson,
M.D., New York | *Meyer, Jacob, New York |
| Harkness, Edward S., New
York | *Mills, D. Ogden, New York |
| Harriman, Mrs. E. H., New
York | *Morgan, J. Pierpont, New
York |
| *Herrick, Everett, M.D., New
York | *Purple, Edwin Ruthven, New
York |
| *Hosack, Alexander E., M.D.,
New York | *Purple, Samuel Smith, M.D.,
New York |
| *Hosack, Mrs. Celine B., New
York | *Starr, Charles J., New York |
| *Inslee, S., New York | Starr, M. Allen, M.D., New
York |
| *Jacobi, Abraham, M.D., New
York | Vanderbilt, Frederick W.,
New York |
| *James, D. Willis, New York | *Woerishoffer, Mrs. Anna, New
York |
| Jenkins, Mrs. Helen Hartley,
New York | *Woerishoffer, Charles F., New
York |
| *Kennedy, John S., New York | *Wood, William H. S., New
York |
| *Loomis, Alfred Lee, M.D.,
New York | _____ |
| | * Deceased. |

LIST OF CANDIDATES RECOMMENDED DURING 1925 FOR ELECTION TO FELLOWSHIP

- | | |
|--------------------------|-------------------------------|
| Bell, Samuel Dennis | Hallett, George DeWayne |
| Berry, Frank Brown | Haseltine, Sherwin Livingston |
| Boynton, Perry Sanborn | Hinton, James William |
| Coley, Bradley Lancaster | Hollander, Edward |
| Cowett, Max Philip | Howard, Robert Carroll |
| Craver, Lloyd Freeman | Huppert, Elmer Isadore |
| Crump, Armistead Cochran | Kempf, Edward John |
| DuBois, Robert Ogden | Klepper, Julius Idel |
| Eller, Joseph Jordon | Klingerstein, Percy |
| Ende, Frank Macbeth | Knox, Leila Charlton |
| Garlock, John Harry | Ladd, William Sargent |
| Greenberg, David | Leshin, Hiram Ralph |
| Graham, John Cooper | Corwin, Edward Henry |
| Hall, Fairfax | Loré, John Marion |

Manheim, Sigmund
 Metzger, Jeremiah
 Meyer, Herbert Willy
 Morrissey, John Henry
 Myers, Lotta Wright
 Platt, Anna
 Randel, William Adonijah
 Ritter, J. Sydney
 Ritter, Saul Alfred
 Scott, James Ralph

And Associate Fellows:

Lewinski-, Ph.D.
 Corwin, Edward Henry

Seecof, David Philip
 Sharlit, Herman
 Simpson, Charles Augustus
 Stepita, Cornelius Travers
 Touart, Maximin De Mouy
 Von Sholly, Anna Irene
 Washburn, Arthur Lawrence
 Wheelwright, Joseph Storer
 Weigel, Elmer Peter
 Wyatt, Bernard Langdon

Heft, Hattie Louise, M.S.